Intellian

v130NX

1.25 m Ku-Ka Convertible Maritime VSAT Antenna System

Installation & Operation User Guide

Serial number of the product

This serial number will be required for all troubleshooting or service inquiries.

Disclaimer

The information in this user guide is subject to change without prior notice throughout the product life cycle. The printed version of the guide is periodically updated, but it may contain inaccuracies or omissions compared to the most recent product information. The most up-to-date information is always available on our website at intelliantech.com.

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Chapter 1. Precautions

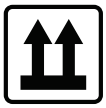
1.1 Warnings, Cautions, and Notes

WARNING, CAUTION, and NOTE statements are used throughout this manual to emphasize important and critical information. You must read these statements to help ensure safety and to prevent product damage. The statements are defined below.

	**WARNING** WARNING indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.
	**CAUTION** CAUTION indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury. It may also be used to alert users about unsafe practices.
	**NOTE** A NOTE statement is used to notify people of installation, operation, programming, or maintenance information that is important, but not hazard-related.

1.2 General Precautions

Before you use the antenna, make sure that you have read and understood all safety requirements.

	**THIS WAY UP** • Place the boxes/crates on the floor with the arrow pointing up.
	**FRAGILE** • Since the Radome is fragile, handle it with care. Do not apply excessive pressure or shock. These may cause surface cracking or other damage.
	**DO NOT STACK** • Do not stack boxes/crates as there is a risk boxes/crates may fall and be damaged.
	**KEEP DRY** • Always make sure the antenna is stored on a dry surface in a dry, well-ventilated area. • The antenna is designed to withstand a normal rain shower; however, water resistance cannot be guaranteed if the antenna is submerged.

* **DO NOT SHIP VIA RAIL:** Ensure not to ship any system via rail.

* **DO NOT STORE THE ANTENNA WRAPPED IN A TARP, TENT, VINYL, OR OTHERS:** To avoid damage to radome paint, do not use a cover on the radome. Using any type of cover may cause paint damage. Intellian radomes are designed to withstand exposure to rain, humidity, and sun/UV rays when assembled according to Intellian instructions, and when the supplied approved hardware and sealants are used. Under no circumstances should an Intellian radome be covered by any protective covering that adheres, bonds, or clings to the surface, whether by self-adhesion or tension.

Chapter 2. Certifications

FCC Declaration of Conformity

Intellian Technologies, manufactures of stabilized maritime VSAT antenna systems for satellite communication at sea, supplies stabilized maritime VSAT antenna systems to the satellite communication service providers for their ESV (Earth Station on Vessels) networks.

FCC §25.222 defines the provisions for blanket licensing of ESV antennas operation in the Ku-band. It defines the antennas radiation, and each article regulates the followings;

§25.222 (a)(1)(i)(A): Regulation for Azimuth Direction & Co Polarization
§25.222 (a)(2)(i)(B): Regulation for Other Direction & Co Polarization
§25.222 (a)(1)(i)(C): Regulation for Cross Polarization

Intellian Technologies, Inc. declares that v130NX complies with the threshold level as defined in §25.222(a)(1)(i)(A):, and declares that v130NX is in accordance with all defined regulations from §25.222(a)(1)(i)(B) to §25.222(a)(1)(i)(C) at the below stated input power spectral density, with an N value of 1.

Product description	Intellian v130NX, 130cm Ku-band maritime VSAT antenna system
EIRP spectral density limit	-14.0 dBW/ 4KHz

Intellian Technologies, Inc. declares that the above antenna will maintain a pointing error of less than or equal to 0.2 degree under specified ship motion conditions in accordance with the requirements of §25.222 (a)(1)(ii).

Intellian Technologies, Inc. declares that the above antennas will automatically cease the transmission with a mute command to the modem within 100 milliseconds if the target satellite and the axis of the main lobe of the ESV antenna exceeds 0.5 degree and will not resume until such angle is less than or equal to 0.2 degree in accordance with the requirements of §25.222 (a)(1)(iii)

Radiation pattern data is available upon request to verify the conformance.

Authority: **Kevin Eom**
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Signature: 

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RED Declaration of Conformity (DoC)

We, Intellian Technologies, Inc. located at 18-7, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do 17709, Korea declare under our sole responsibility that the product(s) described in the below to which this declaration relates is in conformity with the *essential requirements* and *other relevant requirements* of the Radio Equipment Directive (2014/53/EU).

Product Information:

Product Name(s):	Intellian v130NX, 1.3m Ku-band Maritime VSAT Antenna System Intellian v100NX, 1m Ku-band Maritime VSAT Antenna System Intellian v85NX, 85cm Ku-band Maritime VSAT Antenna System

To provide the presumption of conformity in accordance to Annex III(encompassing Annex II) of Directive 2014/53/EU; the following harmonized standards and normative documents are those to which the product's conformance is declared, and by specific reference to the essential requirements of Article 3 of the Directive 2014/53/EU.

2014/53/EU Article	**Standard(s) Applied in Full**	**Result**
SAFETY (Art 3.1.a)	EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013	Pass
EMC (Art. 3.1.b)	EN 301 843-1 v2.1.1	Pass
SPECRTUM (Art. 3.2)	EN 302 340 v2.1.1	Pass

Supplementary Information:

Notified Body Involved: (Testing Organization)	DT&C Co., Ltd. 42, Yurim-ro, 154 beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do 17042, Korea
Technical/Compliance File Held by:	Intellian Technologies, Inc. 18-7, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-di, Gyeonggi-do 17709, Korea
Place and Date of issue:	Gyeonggi-do, Korea on 31 Jan. 2018

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Date: **Sep. 24, 2019**

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UK-CA Declaration of Conformity

We, Intellian Technologies, Inc. located at 18-7, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do 17709, Korea declare under our sole responsibility that the product(s) described in the below to which this declaration relates is in conformity with the *essential requirements* and *other relevant requirements* according to UK legislation Electrical Equipment (Safety) Regulations 2016 (S.I. 2016/1101).

Product Information:

Product Name(s):	Intellian v85NX, 85cm Ku-band Maritime VSAT Antenna System Intellian v100NX, 105cm Ku-band Maritime VSAT Antenna System Intellian v130NX, 125cm Ku-band Maritime VSAT Antenna System Intellian v150NX, 150cm Ku-band Maritime VSAT Antenna System
Model Number(s):	V5-85-UXXX V5-11-UXXX V5-13-UXXX V5-15-UXXX

To provide the presumption of conformity in accordance to Annex III(encompassing Annex II) of Directive 2014/53/EU; the following harmonized standards and normative documents are those to which the product's conformance is declared, and by specific reference to the essential requirements of Article 3 of the Directive 2014/53/EU.

2014/53/EU Article	Standard(s) Applied in Full	Result
SAFETY (Art 3.1.a)	EN 62368-1	Pass
EMC (Art. 3.1.b)	EN 301 843-1	Pass
SPECTRUM (Art. 3.2)	EN 301-360 EN 301-459 EN 303-978	Pass

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Chapter 3. Introduction

3.1 Intellian v130NX Introduction

Intellian v130NX is a Ku-band 3-axis stabilized VSAT maritime antenna system. The v130NX provides advanced VSAT solutions for Ku-band satellite services that are also designed to be converted to Ka-band network. v130NX is equipped with RF module by a new mounting architecture.

The 3-axis stabilized antenna platform was fully optimized with the advanced shock-resistant and vibration damping Pedestal design. It withstands demanding maritime conditions and provides reliable broadband communications.

Installation for v130NX is simplified and operator-friendly by the single coaxial cable connection which combines Tx, Rx and DC power connections in one.

Using Intellian's next generation Antenna Control Software ***AptusNX***, the v130NX antenna can be easily accessed, monitored and controlled. ***AptusNX*** is an intuitive configuration tool which is capable to provide enhanced diagnostics of the antenna system and alerts preventive maintenance issues.

The v130NX comes with both cross-pol and co-pol feeds and is equipped with Intellian's patent pending Global PLL LNB as the standard.

3.2 Intellian v130NX Features

Higher RF Performance

Intellian's highly efficient RF design enables higher data rates and global operation, and it delivers superior performance compared to other 1 meter class antenna systems. The v130NX has improved tracking precision and reliability in a compact and streamlined mechanical design. The v130NX system is supplied with 8 W BUC as the standard and can be provided with 16 W or 25 W BUC optionally to support various bandwidth.

Future Proof Communications

The v130NX can be simply upgraded from Ku- to Ka-band system by changing the center mounted RF Assembly and Feed provided with the conversion kit. Frequency tuned reflector and radome ensure maximum performance across Ku- and Ka-bands.

Single Coaxial Cable

Combined Tx, Rx and DC power in a single coaxial cable, the v130NX was enabled a faster installation of the antenna system as well as reducing the installation cost.

Embedded Dual Antenna Mediator function

Intellian's new ACU supports dual antenna operation without connecting additional hardwares such as a separate mediator, RF splitters and cables. By using the dual antenna system, it eliminates the loss of signal caused by blockage of signal.

AptusNX Intelligent Diagnosis

Intellian's all new integrated M&C platform AptusNX provides responsive web user interface to manage and control the antenna system regardless of device types. Installation Wizard in AptusNX automates functions for system configuration so that operators are minimally involved in system installation and operation, including automatic cable loss compensation, line-up test and auto diagnostics.

Chapter 4. Planning Installation

The antenna installation requires extreme precaution and safety measures given its size and weight. Failure to follow the correct installation process may lead to injury of the installer and/or cause damage to the system. To maximize the performance of the system, a thorough review of this installation guide is strongly recommended. In addition, you should execute the installation process as it is noted in this manual.

CAUTION

DO NOT OPERATE THE ANTENNA WITHOUT THE RADOME. THIS WILL RESULT IN DAMAGE TO THE ANTENNA AND ABNORMAL OPERATION.

4.1 Selecting Installation Site

The system should be placed in an area onboard the vessel with little to no RF signal blockage. When the antenna is transmitting, obstacles in the beam path will cause decreased satellite signal strength. The antenna unit should have direct line-of-sight with the desired satellite without any obstacles in the beam path. Minimum distances between the antenna and other onboard devices must also be considered during installation. Install the antenna in accordance with the following procedures to ensure maximum performance.

4.1.1 Minimize Satellite Blockage

The ideal antenna site should have a clear view of the horizon or satellite with all around clearance. Make sure there are no obstacles within the EL range -20° to +115° from the center of the antenna. Obstacles can interrupt the satellite signal transmission and reception of the antenna.

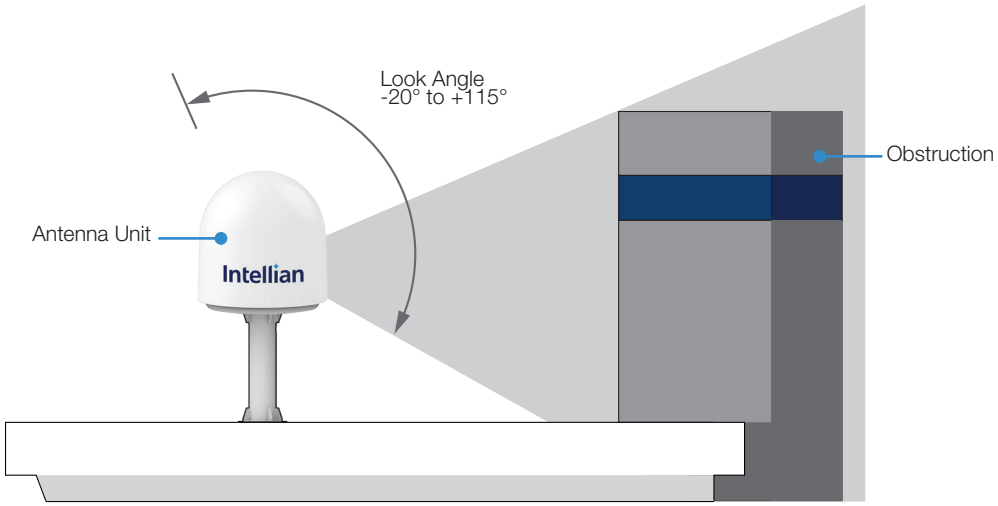


Figure 1: Elevation Limit of Obstacles

4.1.2 Avoid RF Interference

Do not install the antenna near the high power shortwave radar. Most radar transmitters emit RF energy within an elevation range of -15° to +15°. For this reason, you should position the antenna at least 15 feet (4.6 m) away from the radar.

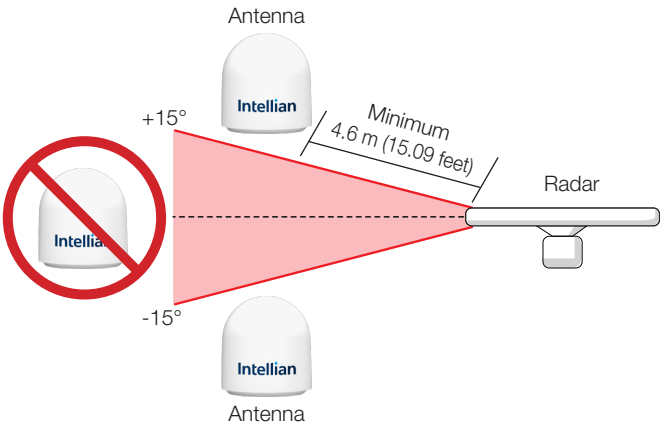


Figure 2: Potential RF Interference

WARNING

Never place the antenna in the beam path of the radar, regardless of distance. The high power shortwave radar may impair its performance or damage the antenna.

4.1.3 RF Hazard Precautions

When the antenna is transmitting there's a potential health risk, as a result of radio frequency (RF) exposure, within the vicinity of the VSAT antenna. The intensity of the RF signal is related to the transmit power, direction and distance to the signal source. In contrary to an omni-directional antenna, the RF transmit signal of a parabolic reflector antenna is concentrated in its direction towards the satellite. Since the antenna is covered with a radome, it's difficult to predict where the antenna is pointed, which could be in any direction within the antenna's range of motion as to the antenna specifications. Although the antenna elevation range is typically down to -20°, it's unlikely for the antenna to transmit at this elevation, while the negative elevation is to compensate for vessel motion. In general, dependent on the satellite link budget, the antenna will have a poor receive signal for a satellite look angle below 10° elevation. In that case when the receive signal threshold is hit, the transmit signal will be blocked, typically referred to as TX mute, on either the modem or antenna. In most situations, the risk of RF exposure is present at lower elevation, corresponding a higher latitude and reduces at higher elevation.

When considering the antenna is typically placed in an area with minimal obstruction and signal interference, an effort should be made to avoid RF exposure as well. It's the responsibility of the antenna owner and/or operator to inform personnel and the general public of the risk of RF exposure. To create awareness, signs should be placed in the potential risk areas. To mitigate the risk of RF exposure, it's suggested to:

- Place the antenna higher up, to avoid the transmit signal reaching work and transit areas.
- Add blockage zones in the ACU for high risk areas of RF exposure.
- Power off the antenna when working in close proximity of the antenna.

While the legislation concerning RF exposure in the country of operation may be different, often reference is made to the ICNIRP guidelines of RF exposure for the occupational and general public scenario. For the frequency range between 6 to 2,300 GHz, the local absorbed power density (Sab) averaged at a 6 minute interval, should not exceed the 5 mW/cm2 for occupational and 1 mW/cm^2 for the general public . The local Sab refers to the power density averaged over a 4 cm^2 surface area of the human body below 30 GHz and a 1 cm^2 surface area above 30 GHz.

FCC limits for the maximum permissible exposure (MPE) for the frequency range of 1,500 – 100,000 MHz are set to 5 mW/ cm^2 for occupational/controlled and 1 mW/cm^2 for the general population/uncontrolled exposure.

Below table shows the minimum safety distance, with reference to the antenna focal line (Figure 3), of the different BUC configurations based on the FCC limits for occupational and general population exposure. The safety perimeter could be reduced by choosing a more suitable location for the antenna and/or adding blockage zones in the ACU.

Tx Power (W)	Occupational (m/ft)	General Public (m/ft)
	Controlled Exposure R(m), 5.0 mW/cm^2	Uncontrolled Exposure R(m), 1.0 mW/cm^2
8W	No distance limit	30.6/100.4
16W	No distance limit	53.4/175.2
25W	19.1/62.7	66.7/218.8

* Main/sub reflector or the feed must avoid contact for all population when the terminal is in transmission.

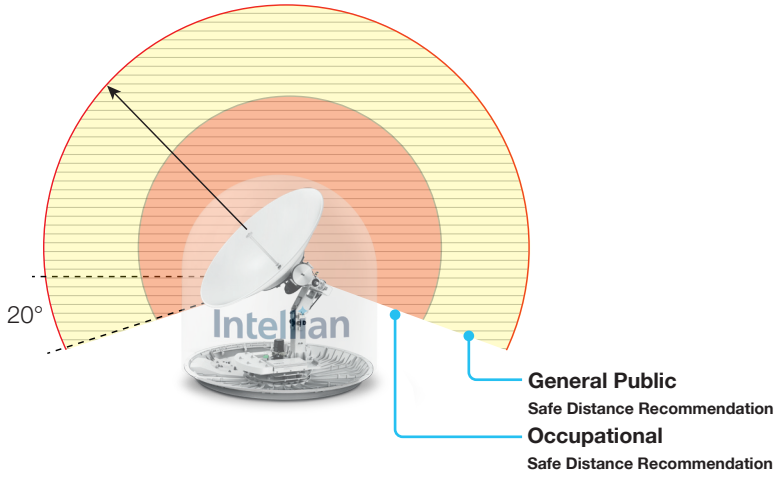


Figure 3: Antenna focal line safety distance

4.2 System Package

4.2.1 Above Deck Unit (ADU)

The ADU includes an antenna pedestal inside a radome assembly unit. The pedestal consists of a satellite antenna main dish with RF components mounted on a stabilized pedestal. The radome protects the antenna pedestal assembly unit from the severe marine environment.

Figure 4: Radome and Pedestal

4.2.2 Antenna Control Unit (ACU)

Antenna Control Unit (ACU) controls Antenna system operation. The following functions are supported by ACU.

- High power supply for the high power BUC
- Mediator function included
- Spectrum analyzer function included
- OLED display
- USB port to download logs and upgrade firmware (no PC required)
- Wi-Fi acess
- AptusNX web application

Figure 5: Front Panel of ACU

Figure 6: Back Panel of ACU

4.2.3 Packing List

Before beginning installation, make sure you have all the included components.

Item	Q'ty	Size	Description
Above Deck Unit (ADU)	1		Radome and pedestal
Antenna Control Unit (ACU)	1	431 mm x 350 mm x 44.3 mm	Antenna Control Unit
Quick Installation Guide (QIG)	1		Installation guide
RF Hazard Sticker	1		Radiation safety distance (70 m) label
Mounting Template	1		Real size drawing of antenna mounting hole pattern
ACU Rack Mount Bracket	2		For installing ACU to 19-inch rack
Flat Head Screw	10	M4 x 12L	For mounting ACU rack mount bracket on ACU
USB Cable (A to A)	1	1.8 m	To connect ACU (front panel left USB port) to PC
AC Power Cord (CEEE7/7)	1	1.5 m	ACU power cord (220 V)
RF Cable (F (M) to F (M))	2	1 m	To connect ACU to modem (Tx / Rx)
Modem Interface Cable (DB-9 (M) to RJ45)	1	1.5 m	To connect ACU to modem (iDirect Modem)
Ethernet Cable (RJ45 to RJ45)	2	1 m	To connect ACU to PC network device
Wi-Fi Dongle	1		For Wi-Fi connection
Hex Bolt (BUMAX)	5	M12 x 80L	Bolt kit for antenna-deck (mast) assembly (1 spare set included)
Flat Washer (BUMAX)	5	M12	
Spring Washer (BUMAX)	5	M12	
Hex Head Wrench Bolt	5	M6 x 40L	Bolt kit for radome assembly (1 spare set included)
Spring Washer and Flat Washer	5	M6	
Cable Tie	20	140 mm	For mounting cables

4.3 System Cables (Customer Supplied)

4.3.1 Antenna RF Cable (Customer Supplied)

Due to the signal loss across the length of RF coaxial cable on L-Band, use only 50 Ω coaxial cable types for standard system RF cable installation. The use of different type of cables (75 Ω coaxial types, etc.) can cause problems. If you need RF cables that run longer than the maximum cable length recommended, contact Intellian Technical Support for assistance.

Cable Requirements

Coaxial Cable Type	Connector	Max. DC Resistance	Attenuation @ 2 GHz	Max. Cable Length (≤ 16 dB loss @ 2 GHz)
LMR400	N (M) to N (M)	0.8 Ω	0.196 dB/m	60 m
LMR600			0.128 dB/m	100 m

NOTE
- Optimal tightening torque for N type RF connector: 1.5 N-m
- Maximum RF loss at 2 GHz: 16 dB including connectors

4.3.2 Gyrocompass Cable (Customer Supplied)

The following general types of gyrocompass cables are recommended for compatible connection to Intellian antennas used in various vessel environments.

Standard	NMEA 2000	NMEA 0183
Connector Type	Micro-C 5 pin connector	2 pin terminal block connector
Cable Type	5-wire single cable	2-wire cable with one enclosed shield cable
Heading Information	Supports PGN, 127250: Vessel Heading	Supports $HEHDT, baud rate 4800, format 8N1 as standard

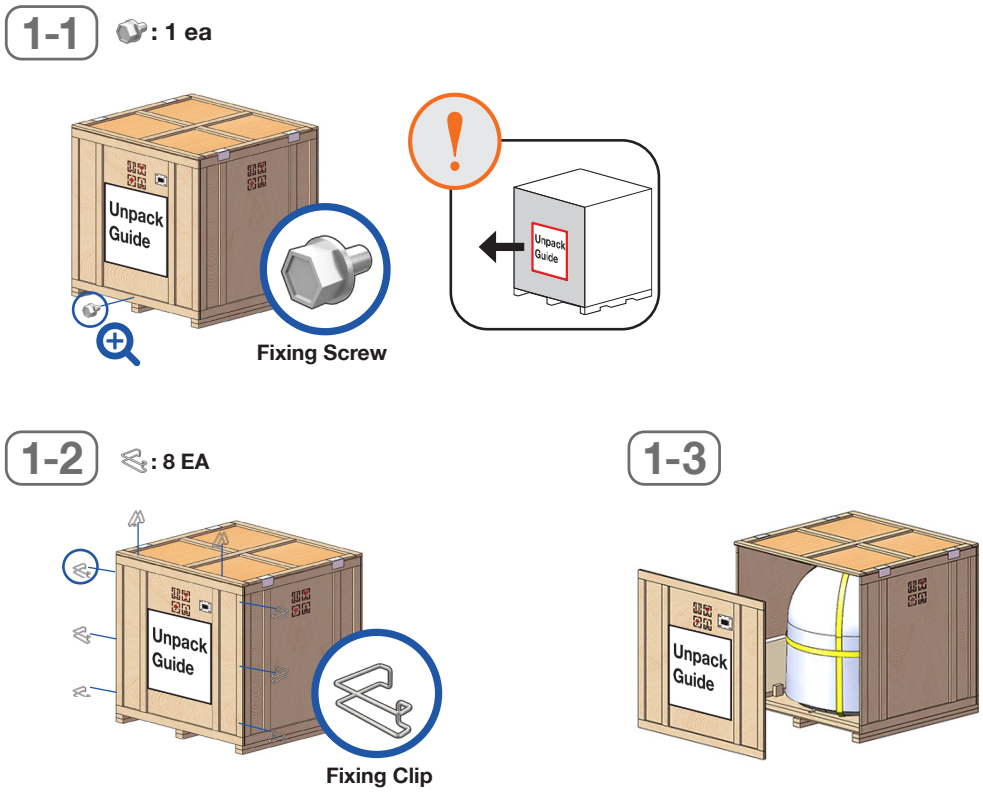
4.4 Unpacking System Package

The pallet should be lifted by a forklift. To unpack the wooden crate, follow the procedure below or refer to the ***Wooden Crate Unpack Guide*** attached on the crate.

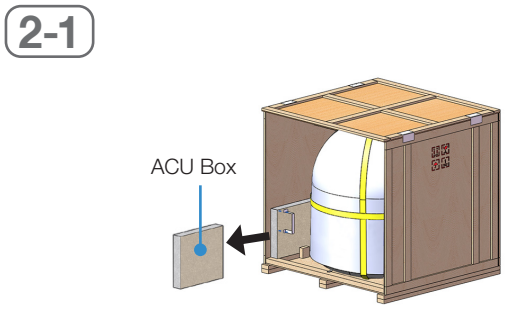
1. Open the side panel with an attached sticker paper (***Wooden Crate Unpack Guide***) by removing the fixing screw (1 ea) and clips (8 ea).

CAUTION

The side with the sticker paper attached must be opened first.



2. The ACU box is placed inside of the side panel. Remove the fixing screws (2 ea) from the holding bracket, then take the ACU box out of the crate.

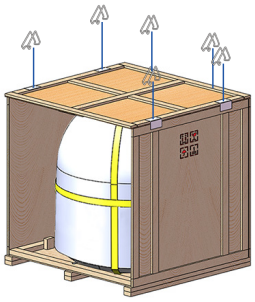


3. Remove the clips (6 ea) that attach the top panel, then carefully slide the top panel out from the crate.

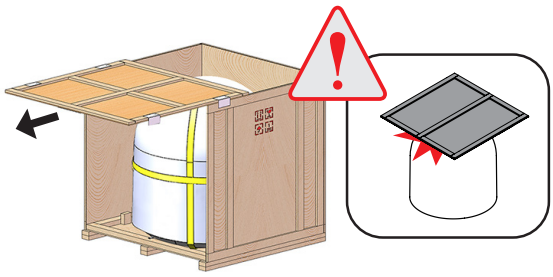
WARNING

The brackets at the top two edges help the top panel to move stably. When removing the top panel, ensure it doesn't fall on the radome.

3-1 : 6 ea

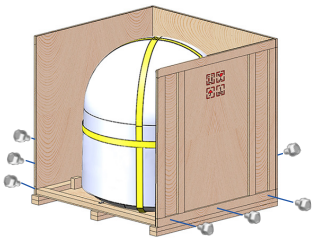


3-2

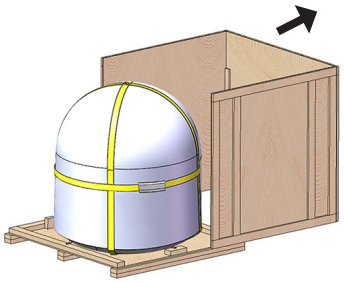


4. Remove the fixing screws (7 ea) that secure the three side panels, then detach the panels.

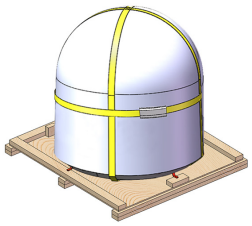
4-1 : 7 ea



4-2



4-3



Chapter 5. Installing Above Deck Unit (ADU)

5.1 Antenna Dimensions

Before installing the antenna unit, confirm its height and diameter (see figure below). The mounting surface and overall space occupied by the antenna must be sufficient for the fully constructed radome on top of its base frame. Using a crane during the antenna installation is strongly suggested.

Unit: mm (inches)

Figure 7: Antenna Front View

NOTE

Position the antenna with the BOW direction parallel to the center line of the ship.

Unit: mm (inches)

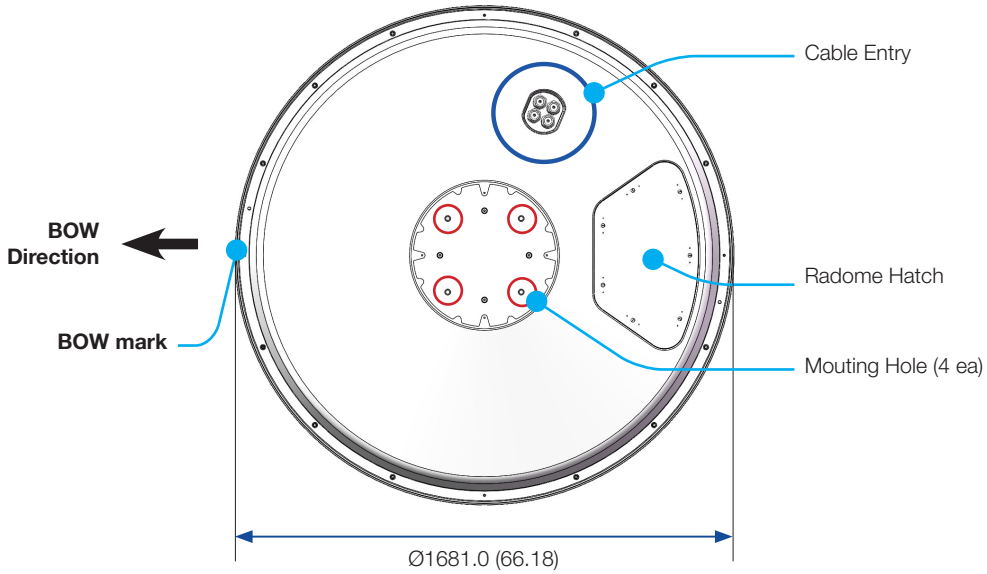


Figure 8: Antenna Bottom View

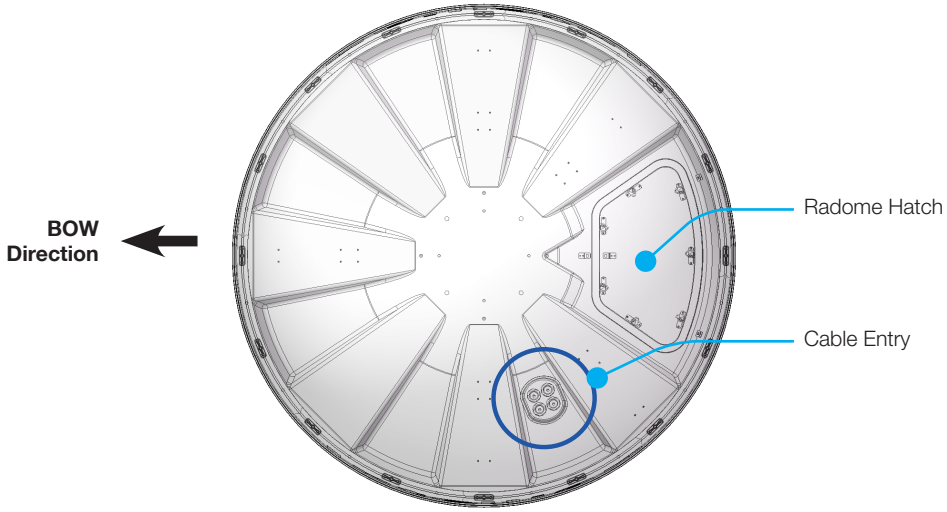


Figure 9: Antenna Top View (Inside Radome)

5.2 Antenna Mounting Hole Pattern

Use the supplied mounting template when drilling mounting holes on the mast. The hole placement for the antenna must match the mounting hole pattern on the template.

WARNING

When reusing an existing mast, make sure the location of the holes on the mast correspond to the hole locations and sizes printed on the mounting template.

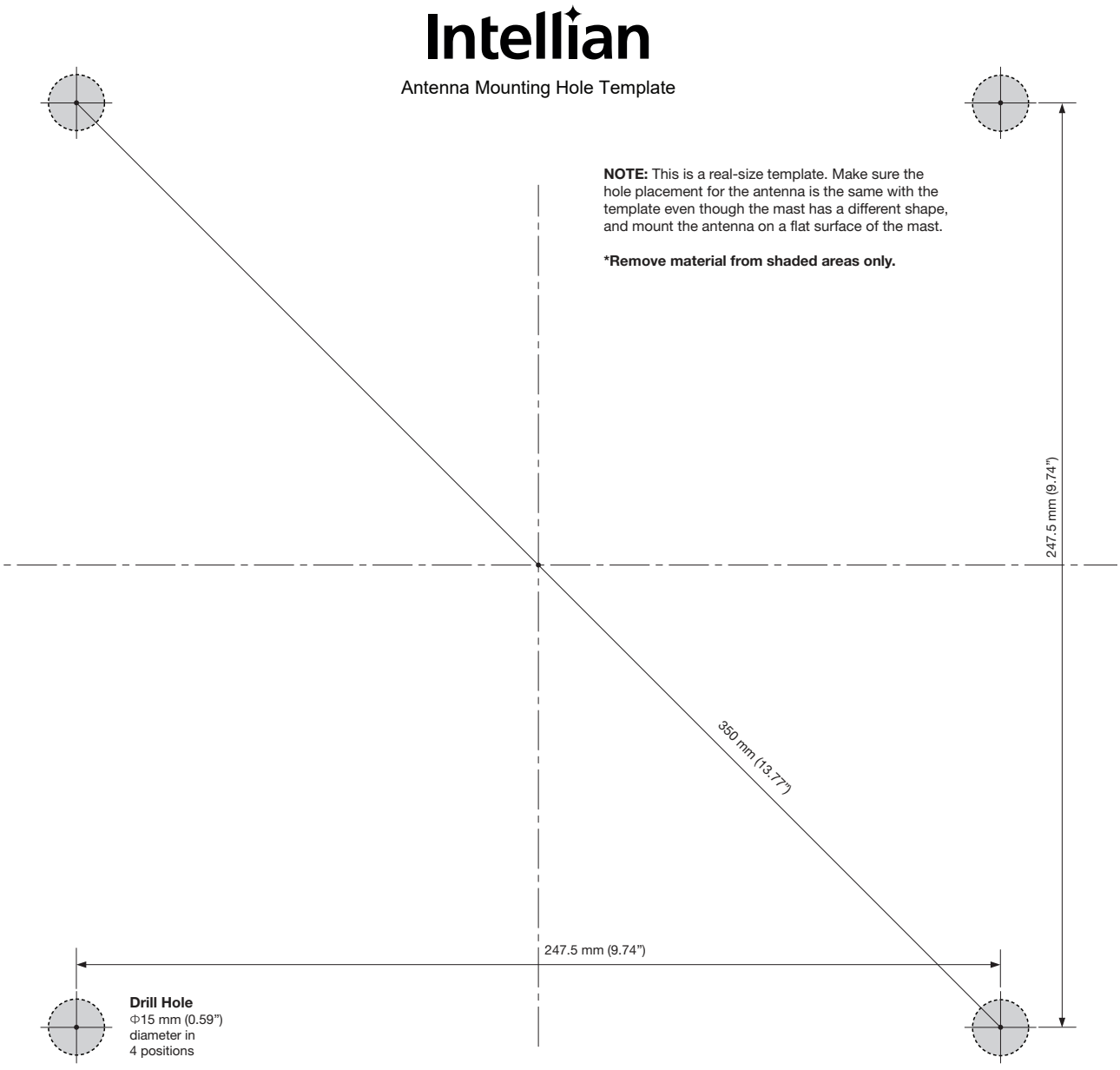


Figure 10: Antenna Mounting Hole Template

5.3 Designing Mast (Example Only)

The installation mast must be robust enough to prevent flex, vibration, and sway when an external force is exerted on the mast with antenna and radome attached. Refer to the following mast drawings for more details.

NOTE

- This is a general example of designing a mast. The shape of mast may differ depending on the ship's environment.
- Follow the Intellian installation recommendations for safety.

WARNING

- When designing a mast, consider the minimum and maximum thickness of the mast plate marked on the diagram. If the thickness of the mast plate is different from the recommended size (Min. 10.0 mm/ Max. 20.0 mm), choose the bolt size bolts for mounting the antenna on the mast according to the table below.

Mast Plate Thickness	Recommended Bolt Size
10 ~ 28 mm (Recommended)	M12 x 80L (Supplied)
28 ~ 35 mm	M12 x 90L

- To use the supplied bolts (M12 x 80L) for mounting the antenna on a mast, the thickness of the mast plate must be 10 ~ 20 mm. The minimum thickness of the mast plate is 10 mm. If the mast plate is thicker than 20 mm, the supplied antenna mast mounting bolts may be too short to mount the antenna on the mast securely.

Unit: mm (inches)

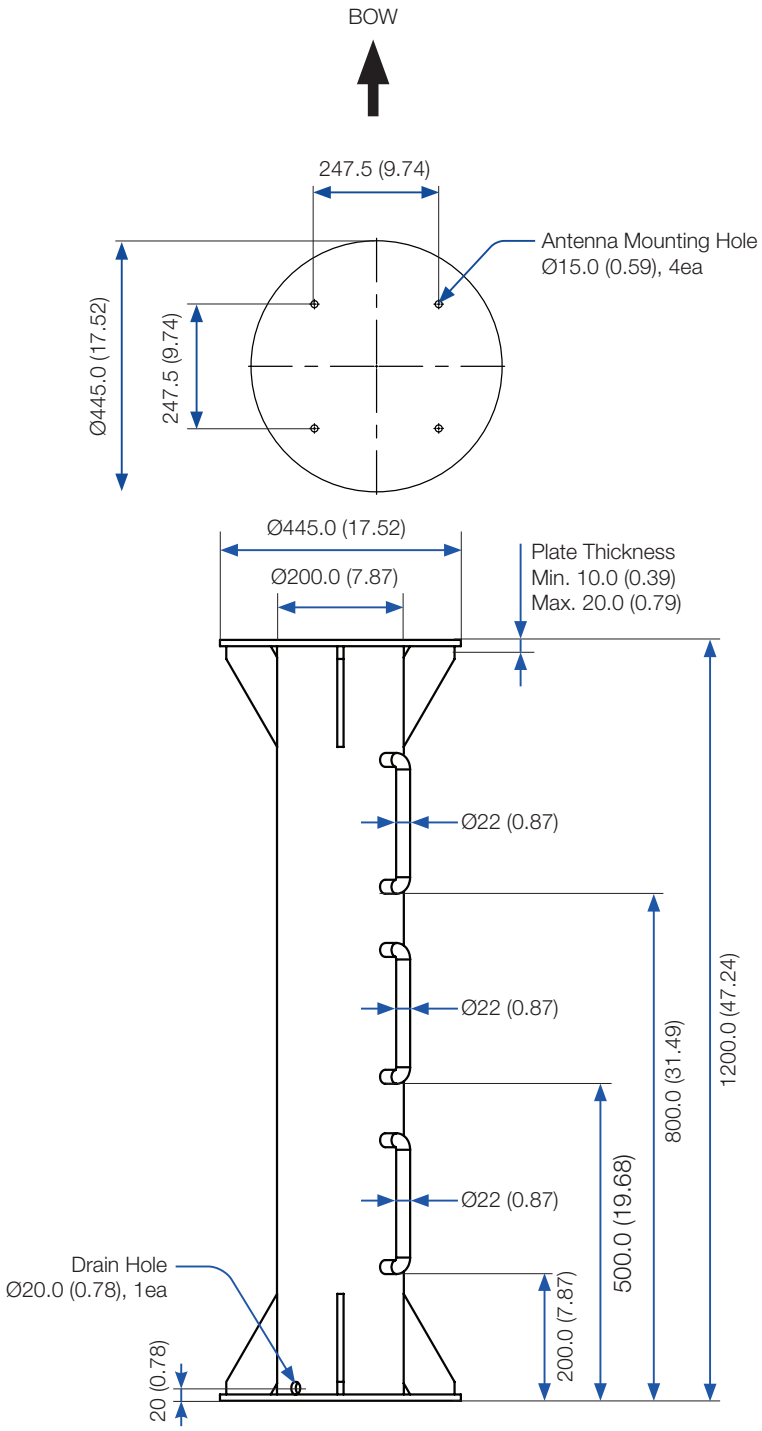


Figure 11: Recommended Size of Mast (Option 1)

5.4 Routing RF Cable on Mast (Example Only)

The cable must be routed from the antenna and through the ship to end up at the antenna control unit. When pulling the cable in place, avoid sharp bends, kinking, and excessive force. After placement, seal the deck penetration gland and tie the cable securely in place. Cable brackets must be installed on the mast to secure the cable. The gooseneck must be installed on the side of the mast to protect the cable from water.

WARNING

Ensure that cable has been run through watertight fittings to prevent water entry into the vessel when installation is completed.

NOTE

This is a general example of routing cables on the mast. The routing method is may differ depending on the ship's environment.

Routing Cable on Outside of Mast

This method is generally recommended.

1. Route the cable from the gooseneck on the deck to the antenna as shown in the picture.
2. Maintain a sufficient cable length (at least 2 m) when routing the cable on the surface of the mast. After connecting the cable to the connector on the radome, adjust the length and fix the cable on the cable brackets using cable ties.

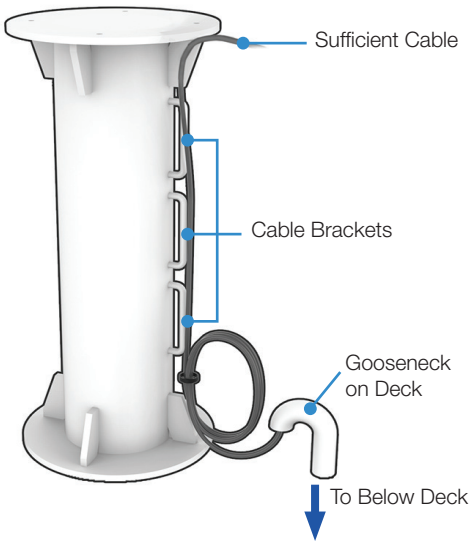
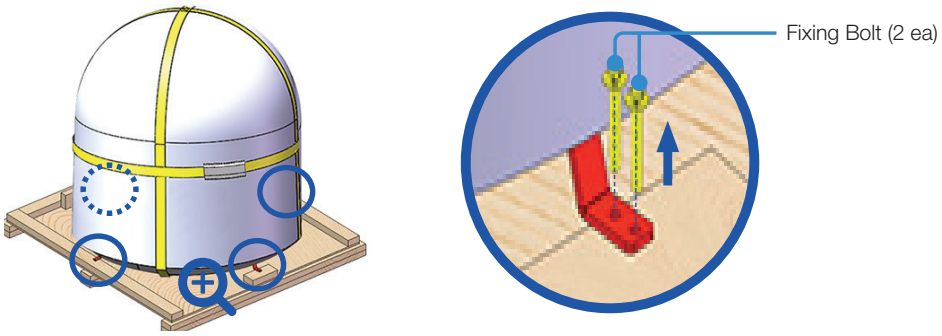


Figure 12: Routing Cable Through Outside of Mast

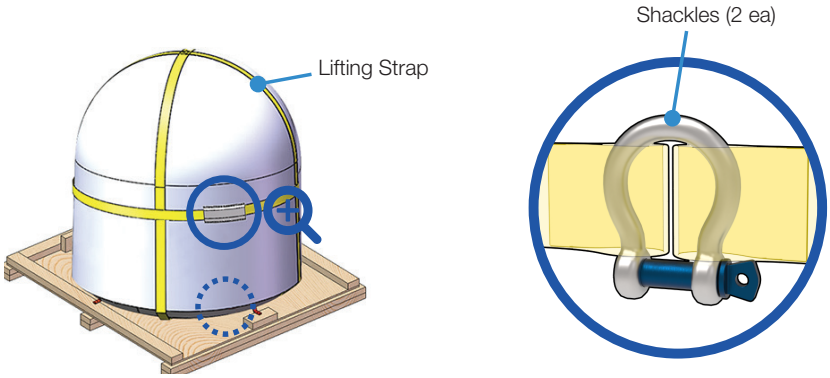
5.5 Removing Antenna from Wooden Pallet

Four radome brackets secure the antenna to the pallet. To remove the radome from the pallet and the brackets from the radome, use the following procedure.

1. Remove the hex head wrench bolts (2 ea) from each of the radome brackets (4 ea) using a wrench.



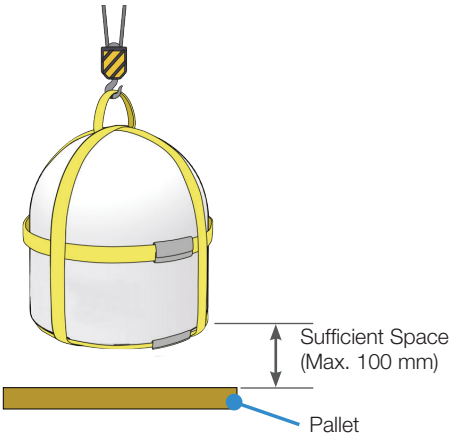
2. Check the condition of lifting straps, and make sure the shackles (2 ea) are tightened. After checking the shackles, re-wrap them with the existing protection to avoid a radome damage.



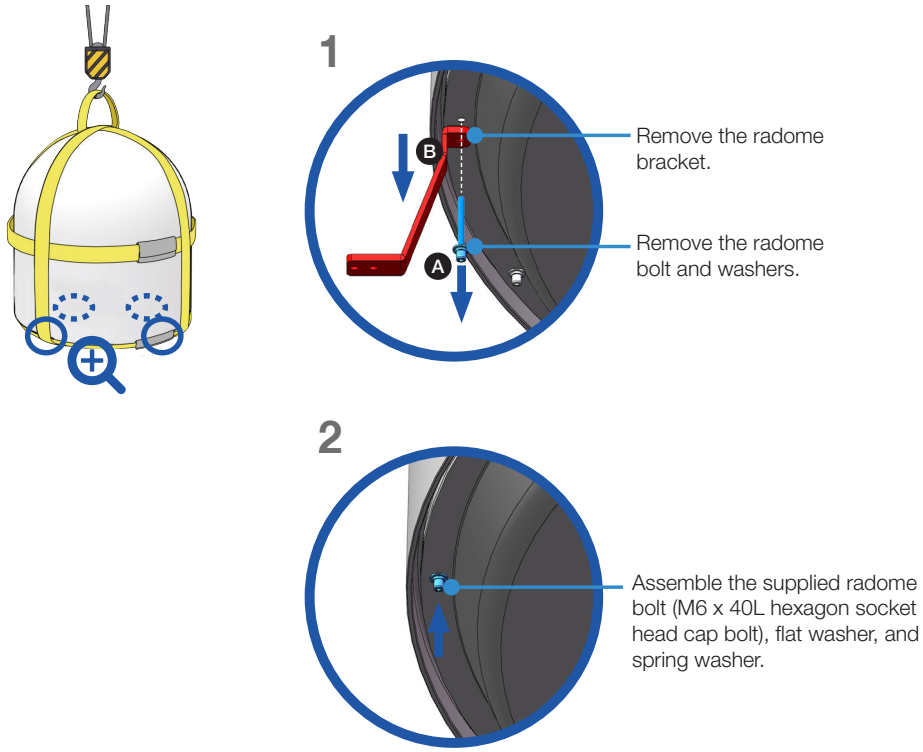
3. Lift the antenna above the pallet using a crane, and maintain a sufficient space (max. 100 mm) between the bottom of the antenna and the pallet to remove the shipping brackets.

WARNING

- Before lifting the antenna, make sure that you have removed the bolts that secure the radome brackets to the pallet. Otherwise, the pallet will not separate from the antenna.
- Be careful when lifting heavy objects. Incorrect handling of heavy objects may lead to personal injury or significant equipment damage.



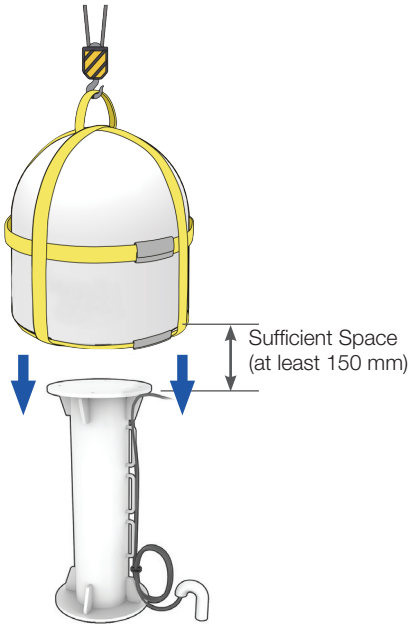
4. Remove the radome bracket bolt (1 ea) using a wrench, and then detach the radome bracket from the radome.
5. Find the supplied hex head wrench bolts (M6 x 40L), spring washers, and flat washers in the ACU box.
6. Apply Loctite #243 on the bolt, and then assemble the bolt and washers to the radome by turning the bolt clockwise using a wrench. DO NOT reuse the removed bolt and washers.
7. Repeat steps 4 through 6 for each remaining radome bracket.



5.6 Moving Antenna Above Mast

The Intellian antenna comes from the factory with the lifting strap pre-mounted.

1. Check the condition of the lifting strap and ensure the shackles are tightened up.
2. Lift the antenna above the mast using a crane and then carefully lower down the antenna toward the mast. Leave at least 150 mm of space between the bottom of the radome and the top of the mast.



WARNING

The antenna may sway in the wind when suspended by a crane. Be careful when handling the antenna.

NOTE

Position the antenna with the BOW direction parallel to the center line of the ship.

5.7 Mounting Antenna on Mast

1. Bring the M12 x 80L hex bolts (4 ea) for antenna-mast assembly from the ACU box.
2. Lower the antenna onto the mast using the crane, making sure the mounting holes of the antenna are aligned with those of the mast. Check the positions of the BOW mark, cable glands, and cable brackets (see Figure 14) when mounting the antenna on the mast. Make sure the cable from the mast is aligned with the cable entry on the bottom of the antenna for stable connection.
3. Apply Loctite #263 to the bolt threads, insert the bolts and washers from under the mast into the built-in nuts on the bottom of the radome (see Figure 14), and then lightly tighten them by hand. Use a crisscross sequence as shown in Figure 13.
4. After installing all 4 bolts, fully tighten the bolts using a torque wrench in the crisscross sequence. Refer to **"12.1 Appendix A. Tightening Torque Specification" on page 120** for the bolt tightening torque.
5. Remove the lifting strap from the antenna.

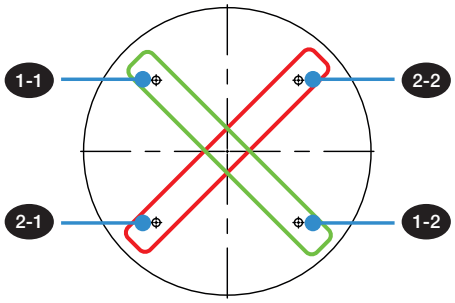


Figure 13: Installing Sequence of Bolts

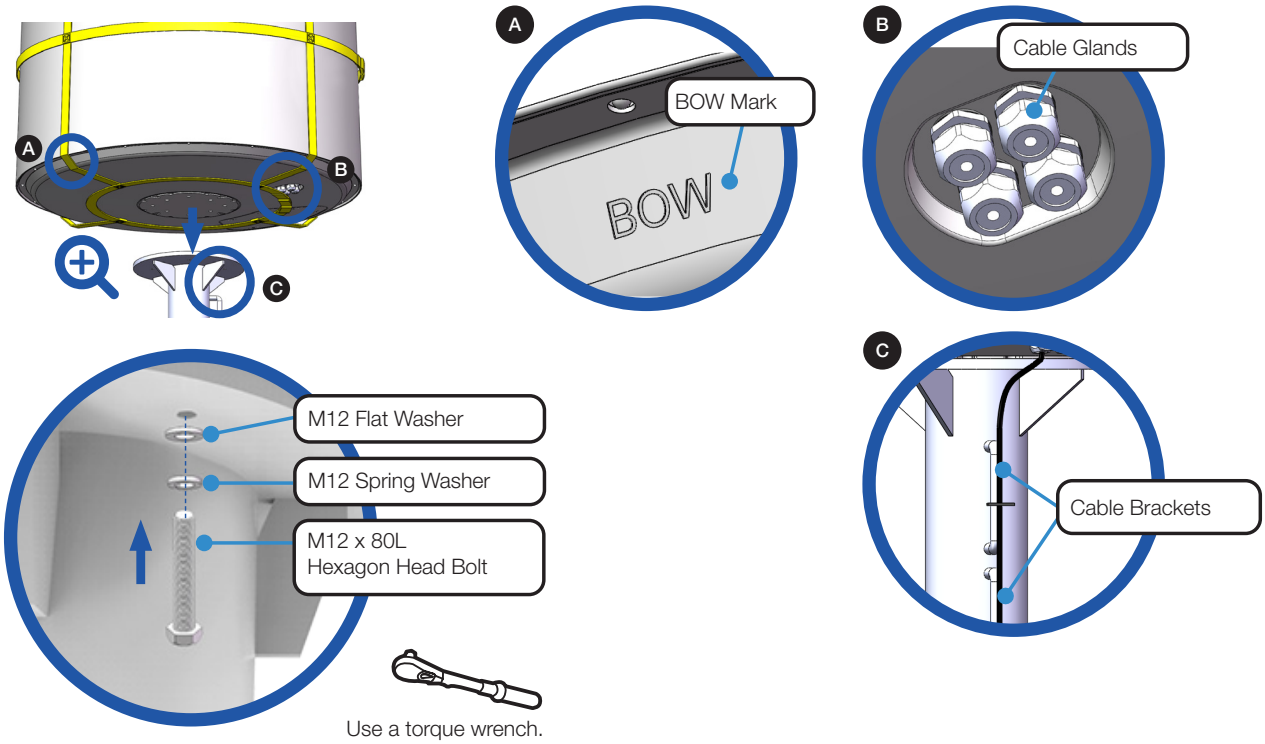


Figure 14: Installing Bolts for Antenna-Mast Assembly

NOTE

- Check the positions of Ⓐ BOW mark, Ⓑ cable glands, and Ⓒ cable brackets when mounting the antenna on the mast.
- Make sure the cable from the mast is aligned with the cable entry on the bottom of antenna for stable connection.
- Refer to **"12.1 Appendix A. Tightening Torque Specification" on page 120** for the bolt tightening torque.

WARNING

If a bolt does not fit into the mounting hole when installing the bolt by hand, stop installing and check the bolt size. DO NOT tighten the bolts forcefully. Forceful tightening can damage the inner threads of the antenna mounting holes. This type of damage is not covered by the warranty.

5.8 Connecting RF Cable to Antenna

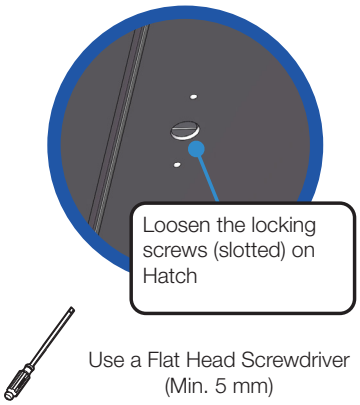
To connect the system cable, access the inside of the radome through the radome hatch. Make sure that there is sufficient space to open the hatch underneath the radome. For the cable connections, terminate cables at each end using proper tools. After connecting the cables inside the radome, adjust the cable lengths and use cable ties to securely fix the cables on the cable brackets of the mast.

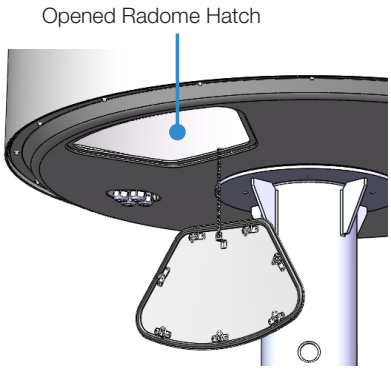
NOTE

Make of sure the following before installing system cables.

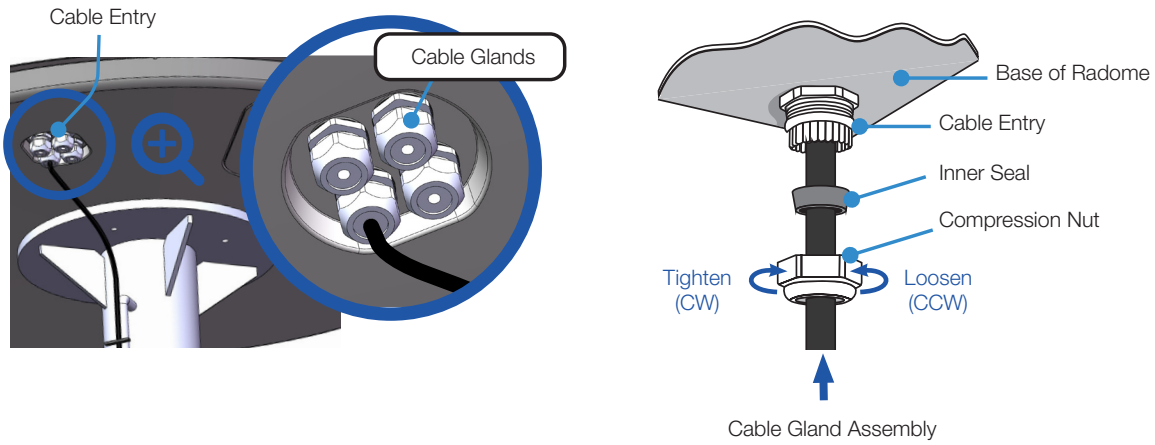
1. All cables need to be well clamped and protected from physical damage and exposure to heat and humidity.
2. Don't use any acutely bent cable.
3. Use watertight glands or swan neck tubes at exposed bulkheads or deck heads where the cable passes through.
4. Install recommended size cables. Refer to**"4.3 System Cables (Customer Supplied)" on page 19** for cable requirements.

1. Loosen the radome hatch locking screws (slotted) (7 ea) using a flat head screwdriver, and then open the radome hatch.





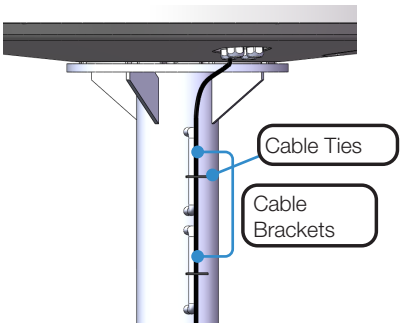
2. Insert the RF Cable come from the ACU into the radome through the pre-installed cable gland at the base of radome. Initially, assemble cable gland temporarily to hold the cables in position. Use the cable gland assembly sequence shown in the figure below, but do not tighten the cable glands completely yet.



NOTE

- To prevent cable damage, insert the RF cable into the radome through the cable gland.
- Cable length inside the radome: Min. 1.8 m / Max. 1.9 m (from the cable entry of radome to the power switch unit before the N connector termination).

3. Loosely tie the cables on the cable bracket using cable ties. Later in the procedure, after connecting the cables inside the radome, you'll be able to adjust the cable length and then securely fix the cables on the cable brackets.



4. Terminate the RF cables with N (M) connectors inside the radome. Intellian recommends using genuine cable connectors and tools. Refer to the cable termination instructions provided by the connector manufacturers.
5. Connect the RF cable to the power switch unit inside the radome (see figures 15 and 16).
6. Ensure the cables are firmly fastened to the connectors, and then fix them on the cable mounts by using cable ties. When the cable is installed completely, turn on the power switch.
7. Fully tighten the cable glands at the base of the radome that you assembled temporarily in step 2.
8. Position the radome hatch, and then close it by installing the locking screws (slotted) (7 ea) using a flat head screwdriver.
9. Adjust the cable lengths, and then securely fix the cables on the mast cable brackets using the cable ties.

WARNING

Ensure that the power switch is off during installation. Turn on the power after install all the cables.

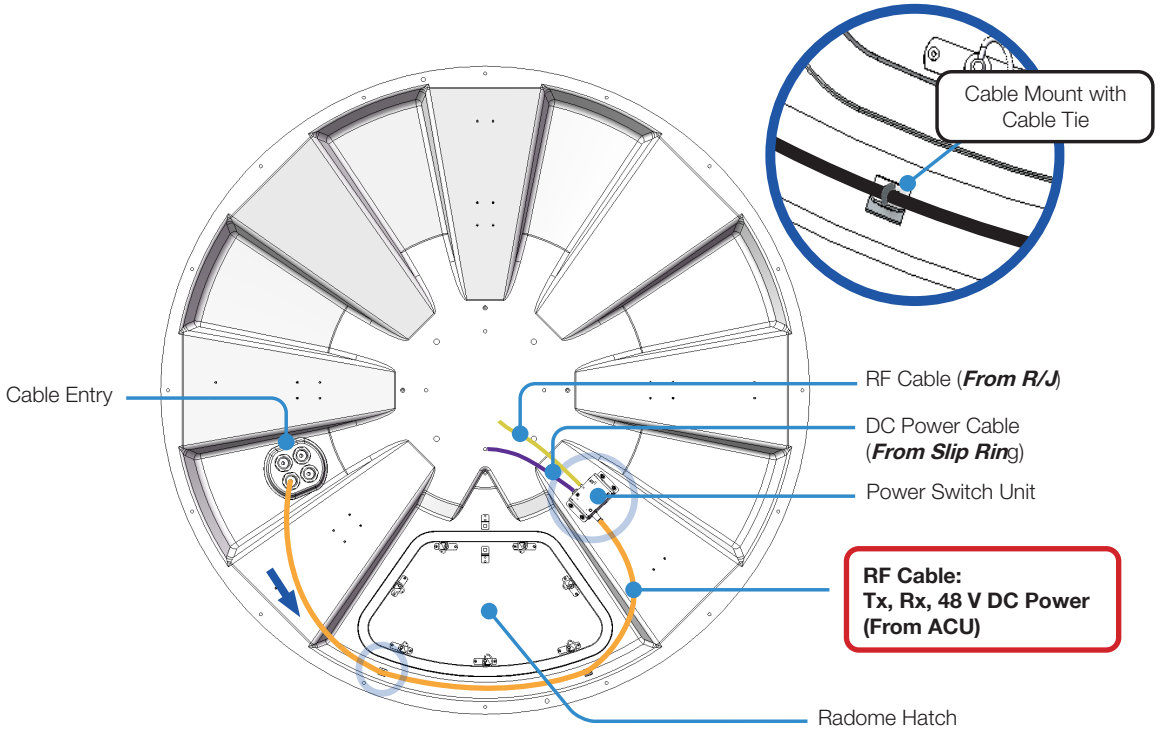


Figure 15: Cable Connection Inside Radome

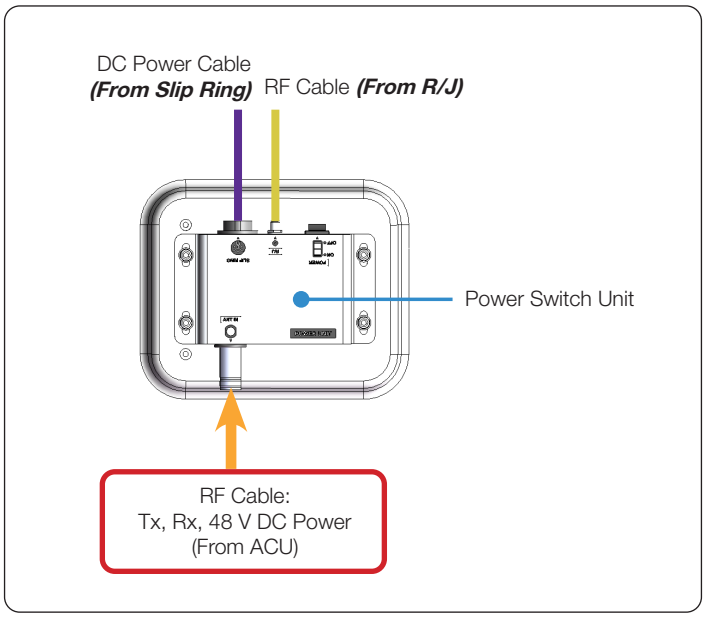


Figure 16: Cable Connection to Power Switch Unit

Chapter 6. Installing Below Deck Unit (BDU)

6.1 Selection of BDU Installation Site

The ACU should be installed below the deck in a location that is dry, cool and ventilated. The front panel of ACU should be easily accessible to users.

6.2 ACU Dimensions

Confirm the dimensions of the ACU before installing it.

Unit: mm (inches)

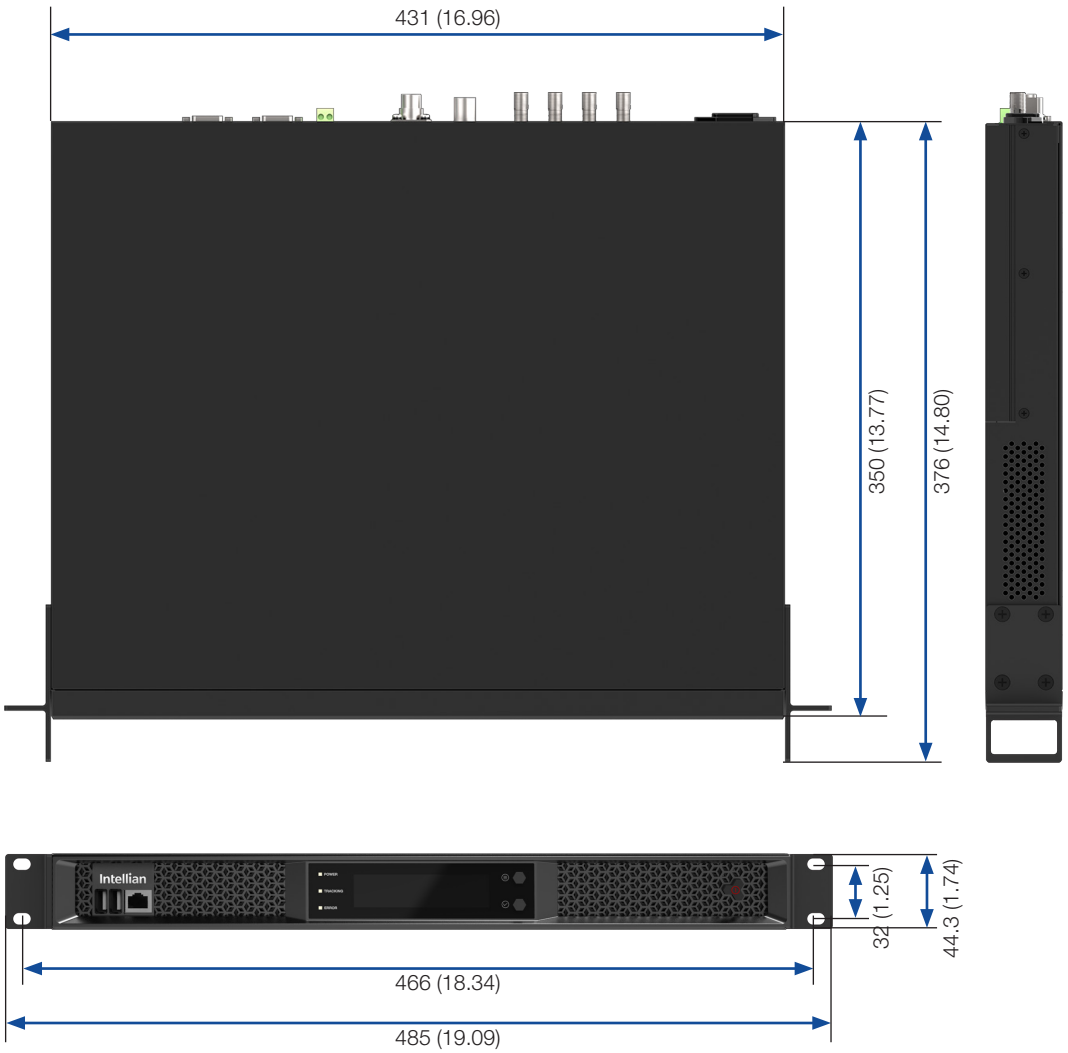


Figure 17: ACU Dimensions

6.3 Mounting ACU

Mounting ACU in a 19" Rack

The ACU can be installed in a 19" rack using the two rack mount brackets that are included in the ACU box. Attach the rack mount brackets to the sides of the ACU using the included M4 x 12L flat head screws (8 ea). Connect cables to the back side of the ACU.

Figure 18: 19" Rack Mounting ACU

WARNING

Ensure that the cables connected to the ACU are long enough to prevent damage when the ACU is pulled out from the rack.

6.4 Antenna System Configurations

For the proper operation of the satellite communication system, the required components must be connected as shown in the figure below. Separate purchase of a satellite modem, switch router and ship's gyrocompass may be needed.

6.4.1 Single Antenna System Configuration (Basic Antenna System)

The basic system consists of one VSAT antenna and one ACU. Connect the cables as shown in the configuration below.

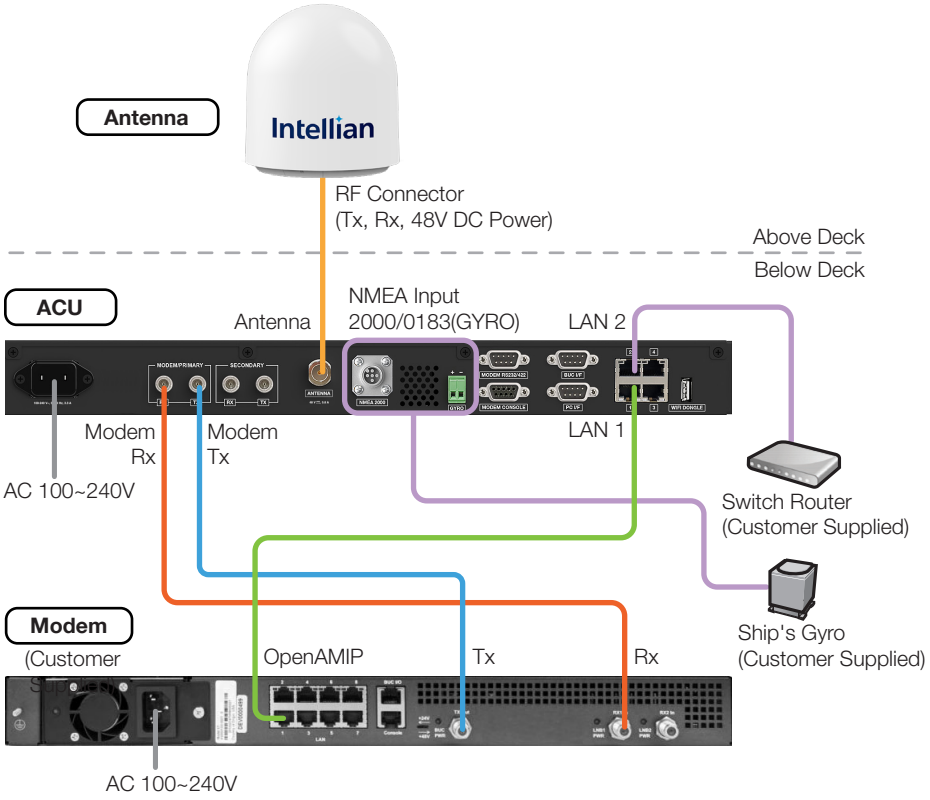


Figure 19: Single Antenna System Configuration (Basic Antenna System)

6.4.2 Dual Antenna System Configuration (Optional)

The dual system consists of two VSAT antennas and two ACUs. The ACUs have embedded Dual Antenna Mediator function, which is capable of controlling and managing two VSAT antenna systems simultaneously. As shown in the configuration, connect the cables correctly.

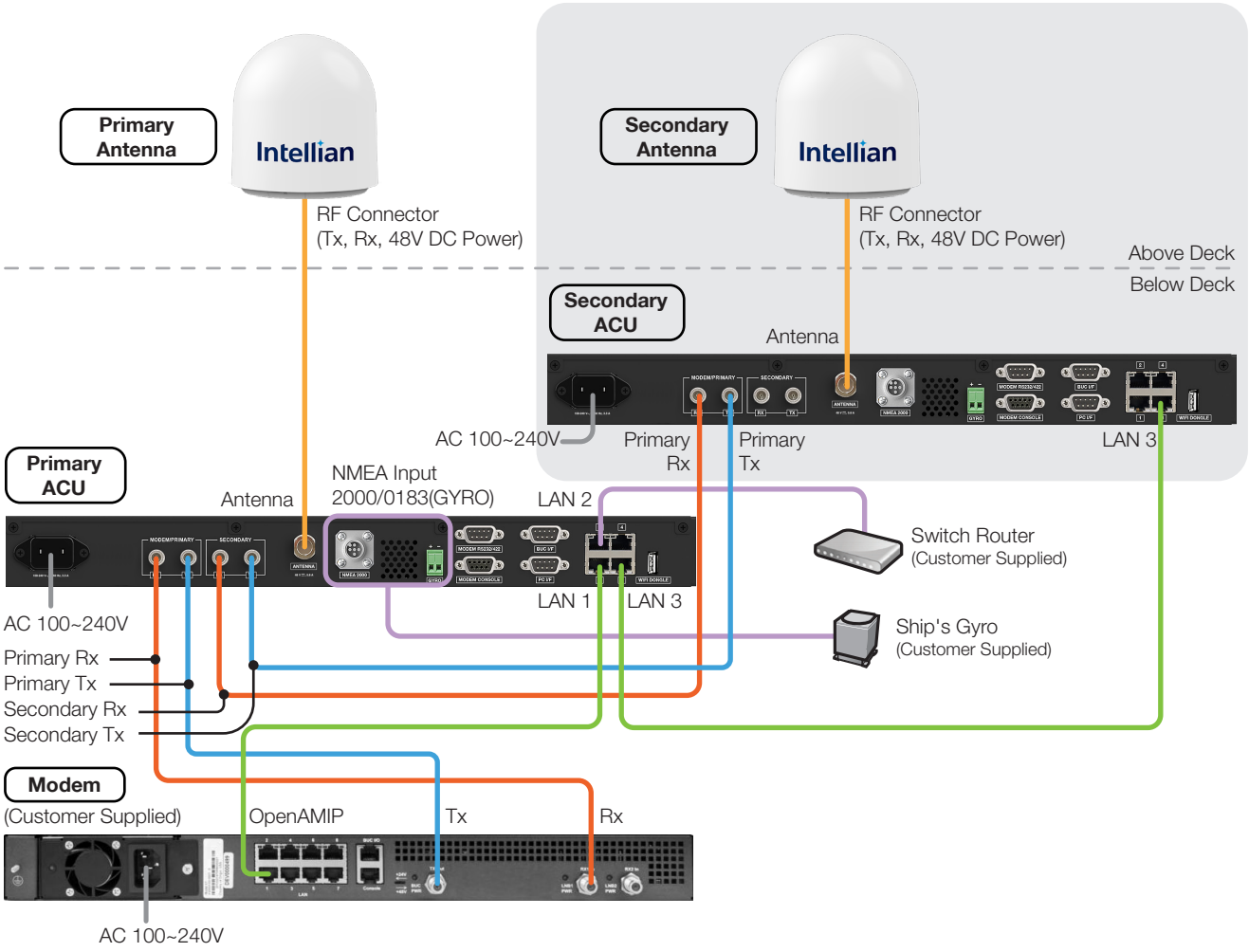


Figure 20: Dual Antenna System Configuration

NOTE

Refer to **"12.2 Appendix B. Starting Dual Antenna System (Optional)" on page 121** for more information.

6.5 ACU Cable Connection

6.5.1 ACU Back Panel Connectors

The following figure shows the ACU back panel connectors.

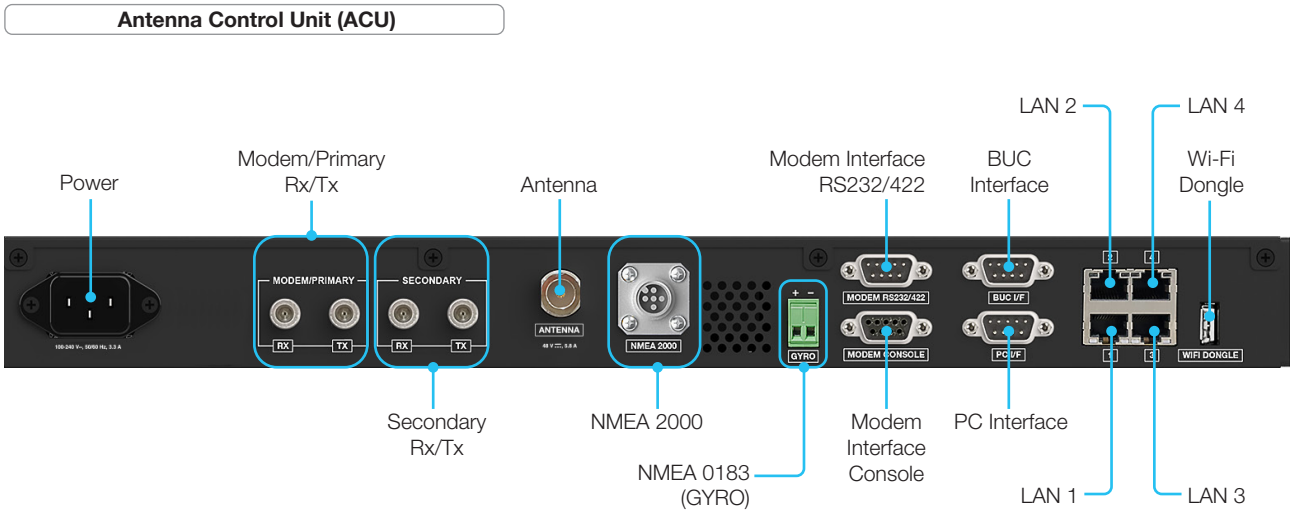
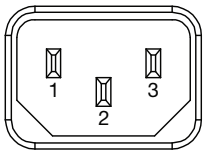


Figure 21: ACU Back Panel Connectors

6.5.2 ACU Connector Pinout Guide

Reference the following connector pinout information for the connection ports of the ACU.

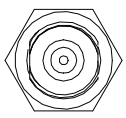
Power Connector



IEC 320 C14 Plug Male

Pin	Signal
1	NEUTRAL
2	GND
3	LIVE

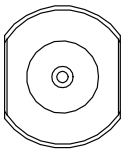
Modem Primary / Secondary Tx and Rx Connectors



RF F Type Female

Conductor	Function
Inner	DATA
Outer	GND

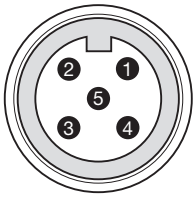
Antenna Connector



RF N Type Female

Conductor	Function
Inner	RX, TX, FSK, REFERENCE, POWER
Outer	GND

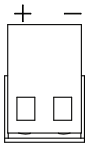
NMEA 2000 Input



Micro-C 5-Pin Male

Pin	Signal
1	N/C
2	N/C
3	N/C
4	NET-H (CAN-H)
5	NET-L (CAN-L)

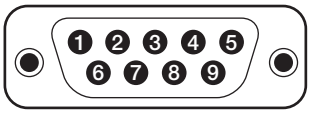
NMEA 0183 Input



2-Pin Terminal Block

Pin	Signal
+	HEADING IN
-	HEADING GND

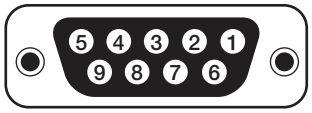
Modem Interface - RS232 & RS422 Connector



D-Sub 9-Pin Male

Pin	Signal
1	N/C
2	MODEM TX / MAX422 RX+
3	MODEM RX / MAX422 TX+
4	N/C
5	GND
6	N/C
7	MAX422 RX-
8	MAX422 TX-
9	N/C

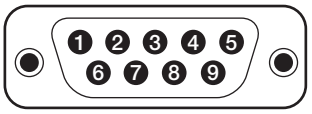
Modem Interface - Console Connector



D-Sub 9-Pin Female

Pin	Signal
1	GND
2	GPS_OUTA
3	MODEM_LOCK
4	MUTE 0
5	N/C
6	GPS_OUTB
7	EXM_AGC
8	MUTE 1
9	N/C

BUC Interface - RS232/RS422 Connector



D-Sub 9-Pin Male

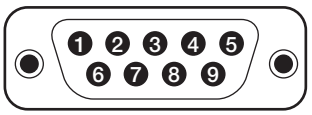
- **For Ku-band - RS232**

Pin	Signal
1	N/C
2	BUC RS232 RX
3	BUC RS232 TX
4	GND
5	GND
6	N/C
7	N/C
8	N/C
9	N/C

- **For Ka-band (Optional) - RS422**

Pin	Signal
1	BUC RS422 RX+
2	BUC RS422 RX-
3	BUC RS422 TX+
4	GND
5	GND
6	BUC RS422 TX-
7	BUC KEYLINE RX+
8	BUC KEYLINE RX-
9	N/C

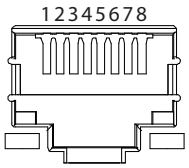
PC Interface - RS232 Connector



D-Sub 9-Pin Male

Pin	Signal
1	N/C
2	PC RX
3	PC TX
4	N/C
5	GND
6	N/C
7	IARM TO PC_ DBG_ TX
8	PC TO IARM_ DBG_ RX
9	N/C

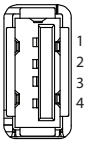
ETHERNET (LAN) Connector (LAN 1~LAN 4)



RJ-45 Female

Pin	Signal
1	TX-
2	TX+
3	RX-
4	N/C
5	N/C
6	RX+
7	N/C
8	N/C

Wi-Fi Dongle USB Connector



USB A Female

Pin	Signal
1	+5 V
2	DATA-
3	DATA+
4	GND

6.5.3 Connecting Power to ACU

Connect the power cord from the power supply to the power connector (100~240 VAC) of the ACU.

Figure 22: Connecting Power to ACU

6.5.4 Connecting ACU to Antenna

Connect an Antenna RF cable (N to N) (customer supplied) from the **ANTENNA (N) port** of the ACU to the **RF (N) port** of the radome (antenna).

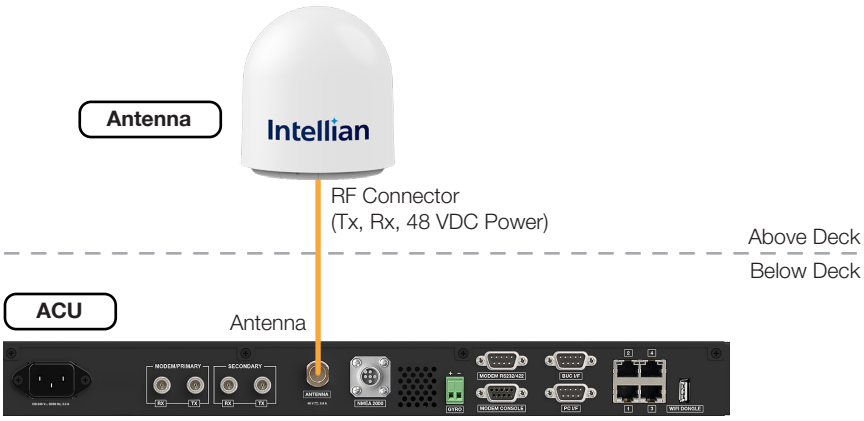


Figure 23: ACU to Antenna Cable Connection in Single Antenna System

6.5.5 Connecting ACU to Antenna in Dual Antenna System (Optional)

For the Dual Antenna System, the antenna system needs to be installed with two ACUs and two antennas.

1. Connect an **Antenna RF cable (N to N)** (customer supplied) from the **ANTENNA (N) port** of the Primary ACU to the **RF (N) port** of Primary Antenna.
2. Connect another **Antenna RF cable (N to N)** (customer supplied) from the **ANTENNA (N) port** of the Secondary ACU to the **RF (N) port** of Secondary Antenna.

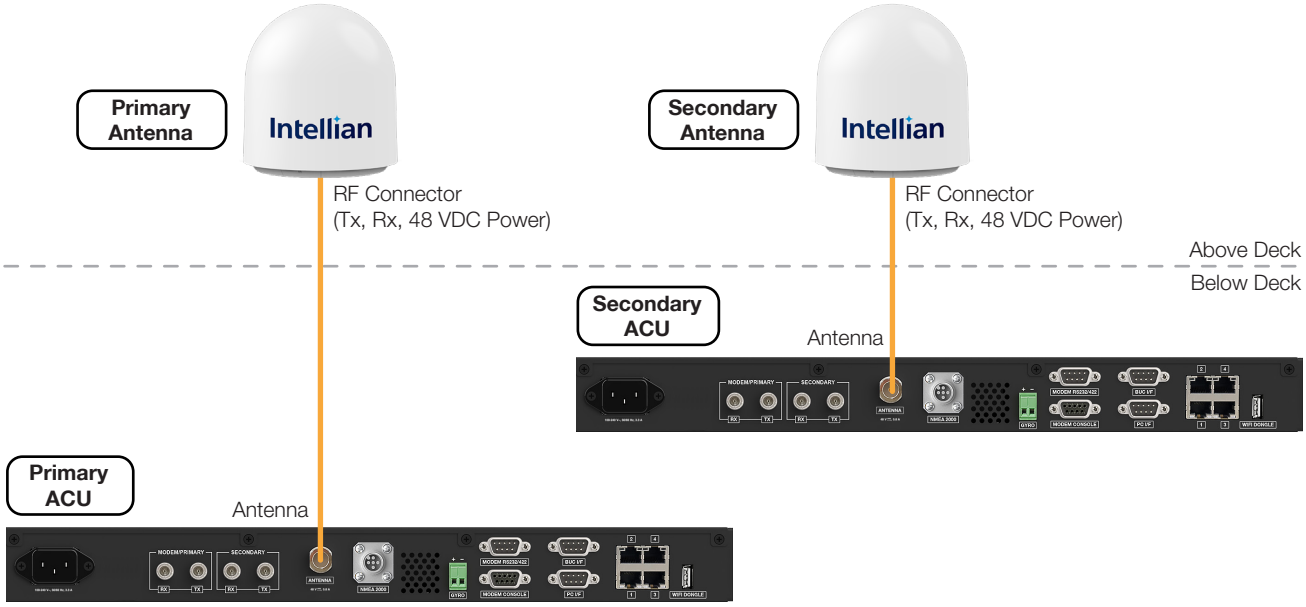


Figure 24: ACU to Antenna Cable Connection for Dual Antenna System

6.5.6 Connecting Primary/Secondary ACUs in Dual Antenna System (Optional)

For the Dual Antenna System, the antenna system needs to be installed with two ACUs and two antennas.

1. Connect a **RF cable (F to F)** from the **Secondary Rx (F) port** of the Primary ACU to the **Primary Rx (F) port** of Secondary ACU.
2. Connect another **RF cable (F to F)** from the **Secondary Tx (F) port** of the Primary ACU to the **Primary Tx (F) port** of Secondary ACU.
3. Connect an **Ethernet cable** between the **LAN 3 (RJ45) ports** of each Primary and Secondary ACUs.

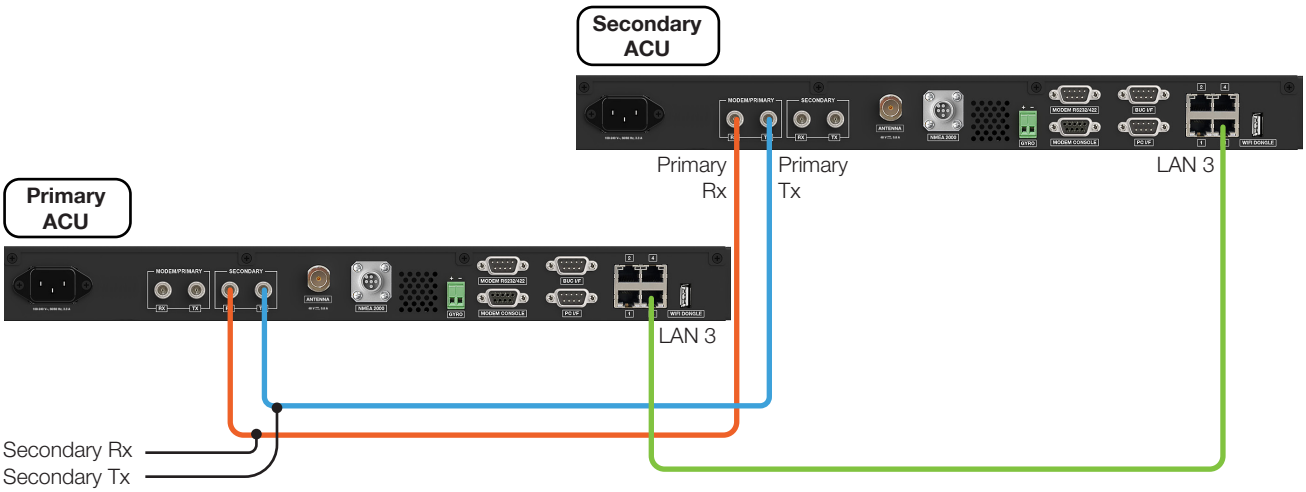


Figure 25: Primary and Secondary ACU Cable Connection in Dual Antenna System

6.5.7 Connecting ACU to Modem

1. Connect a **RF cable (F to F)** from the **MODEM Rx (F) port** of the ACU to the **Rx (F) port** of the modem.
2. Connect another **RF cable (F to F)** from the **MODEM Tx (F) port** of the ACU to the **Tx (F) port** of the modem.
3. When using the OpenAMIP modem protocol, connect an **Ethernet cable** from the **LAN 1 (RJ45) port** of the ACU to a **LAN (RJ45) port** of the modem.

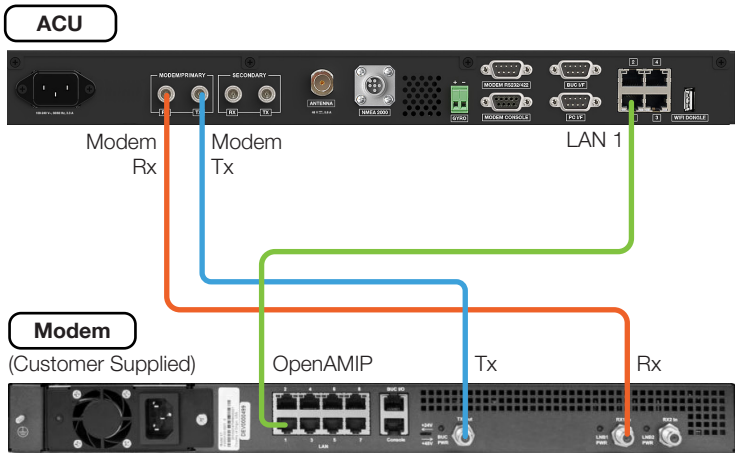


Figure 26: ACU to Modem Cable Connection

6.5.8 Connecting ACU to Switch Router

Connect an **Ethernet Cable** from the **LAN 2 (RJ45) port** of the ACU to a **LAN (RJ45) port** of the Switch Router.

Figure 27: ACU to Switch Router Cable Connection

6.5.9 Connecting ACU to Ship Gyrocompass

For satellite tracking, connect a ship gyrocompass to the antenna system through the gyrocompass interface of the ACU. The Intellian ACU supports NMEA 0183 and NMEA 2000 gyrocompass inputs. If the gyrocompass has a different output standard, use a compass converter to supply the required NMEA input. The NMEA 2000 gyrocompass needs to be purchased separately.

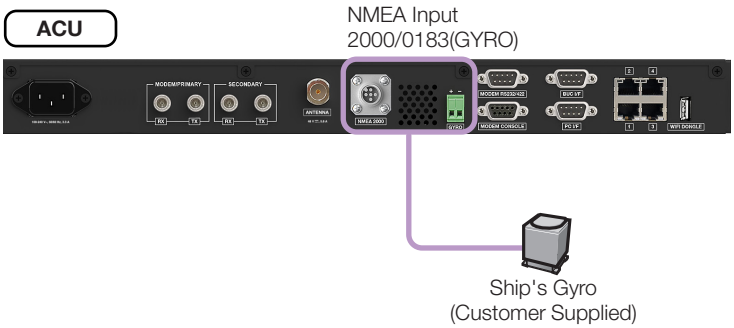
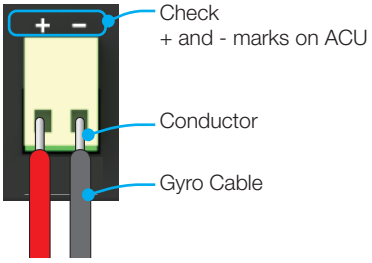


Figure 28: ACU to Ship's Gyrocompass Cable Connection

How to Connect NMEA 0183 Gyrocompass Cable

1. Using a Phillips screwdriver, loosen the two screw terminals by rotating them counterclockwise.
2. Strip wires up to 5 mm (0.2"). Do not solder the cables.
3. Insert the conductor and gyro cable wires into the – (negative) and + (positive) terminals, respectively, of the terminal block. The polarity of the terminal is indicated on the ACU with + and - marks. Check the polarity to make sure the wires are inserted correctly.



4. Fully tighten the terminal block screws by rotating them clockwise to clamp the wires securely.
5. Insert the terminal block with gyro cables to the **NMEA 0183 (GYRO) port** of ACU.

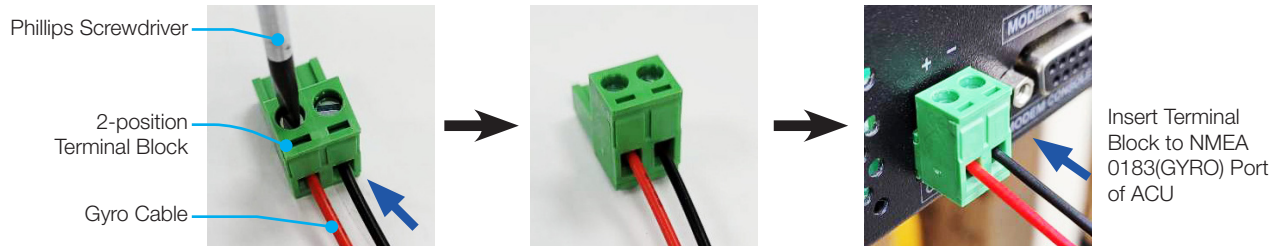


Figure 29: NMEA 0183 Gyrocompass Cable Connection

6.6 ACU to PC Communication Setup

You can establish the data communication between the ACU and a PC using a TCP/IP (Ethernet), USB, or Wi-Fi connection.

6.6.1 TCP/IP Connection

Connection through Front Panel Management Port

The network is automatically configured by DHCP with no additional PC IP configuration required.

1. Connect an Ethernet cable from the management LAN port on the front panel of ACU to a LAN port of the PC. The network connection is established automatically.
2. Open a web browser (Chrome, Firefox, etc.), and then enter the following IP address to access Intellian ***AptusNX*** Login page.
   - **IP Address: 192.168.2.1 (Default)**

Figure 30: Front Panel Management LAN Port Connection

6.6.2 USB Connection

Using Right Side USB Port on ACU Front Panel

Connect a USB flash drive to the right side USB port on the front panel of ACU to download logs, backup/ restore antenna settings, and upgrade firmware.

Using Left Side USB (Serial) Port on ACU Front Panel

Connect the supplied USB Cable (A to A) from the left side USB (serial) port on the front panel of ACU to PC for monitoring and controlling the antenna system.

NOTE

- The left side USB port is only for certified engineers' use only.
- AptusNX access and iARM upgrade are NOT supported through the serial USB connection.

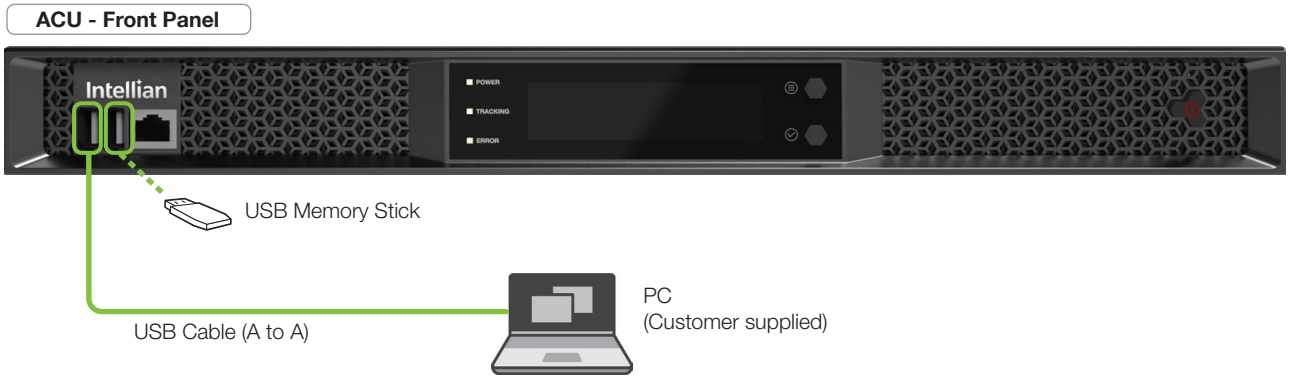


Figure 31: Front Panel USB Port Connection

6.6.3 Wi-Fi Connection

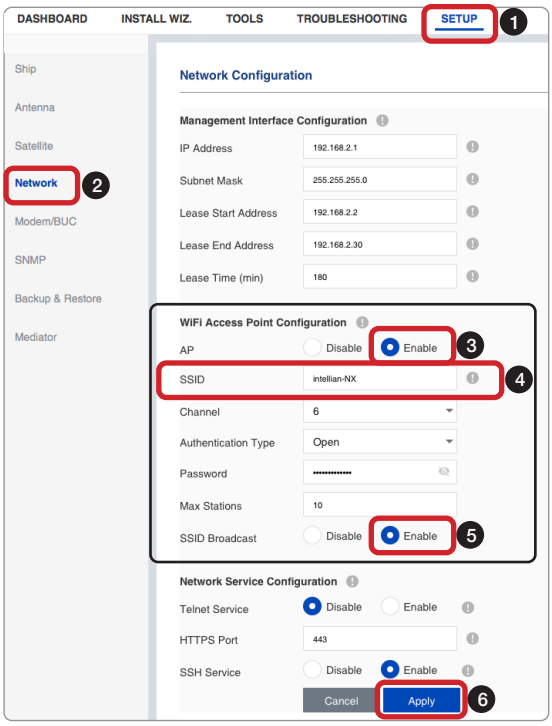
Connection through Wi-Fi Dongle

Intellian provides the Wi-Fi Dongle for Wi-Fi connection to AptusNX. You can connect a PC to the ACU via Wi-Fi for easy management and control whenever you are on the vessel.

1. Connect an Ethernet cable from the Management LAN port on the front panel of ACU to a LAN port of a PC. The network connection is established automatically.
2. Find the Wi-Fi Dongle in the ACU box, and then insert the Wi-Fi Dongle into the USB port on the back panel of ACU.

Figure 32: Back Panel Wi-Fi Dongle Connection

3. Open a web browser, and then enter the following IP address to access Intellian AptusNX Login page.
   - **IP Address: 192.168.2.1 (Default)**
4. Log in to AptusNX by typing the User Name and Password. If the system has not been changed from the factory default:
   - **User Name: intellian**
   - **Password: 12345678**
5. Select **SETUP** on the main menu, and then select the **Network** sub menu. Under the **Wi-Fi Access Point Configuration**, choose **Enable** for the **AP** . If you don't want to use Wi-Fi connection, choose **Disable** for the **AP**.
6. Note the **SSID** (Wi-Fi access point/network name) information.
7. Choose **Enable** for the **SSID Broadcast** option to show the **SSID** (Wi-Fi access point/network name) information.
8. Click the **Apply** button to apply the settings to the system. For more information, see **"9.8.3 iARM Save & Reboot" on page 92**.
9. After a reboot, you can connect to the Wi-Fi with any network enabled device..



Chapter 7. Operating Install Wizard

7.1 Turning On System

Make sure the antenna has a clear view of the sky. Press the **POWER** button on the front panel of the Antenna Control Unit/ACU, and then wait a few minutes for system startup. Once the antenna finds the satellite, the **POWER** indicator light on the ACU display will turn green.

7.2 Accessing AptusNX

The network is automatically configured by DHCP with no additional PC IP configuration required.

1. Connect an Ethernet cable from the management LAN port on the ACU front panel to a LAN port of a PC. The network connection is established automatically.
2. Open a web browser (Chrome, Firefox, etc.), and then enter the following IP address to access Intellian ***AptusNX*** Login page.
   - **192.168.2.1 (Default)**
3. Log in to ***AptusNX*** by entering the User ID and Password.
   - **User ID: intellian (Default)**
4. **Password: 12345678 (Default)**

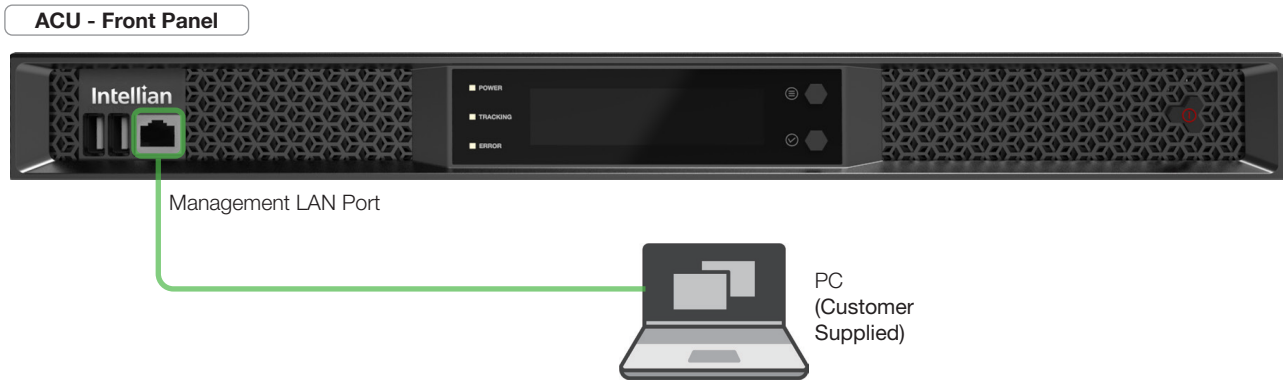
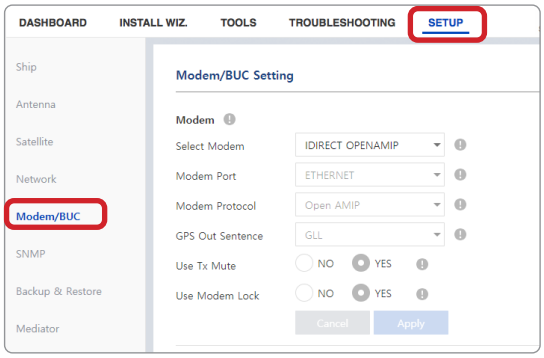


Figure 33: Front Panel Management LAN Port Connection

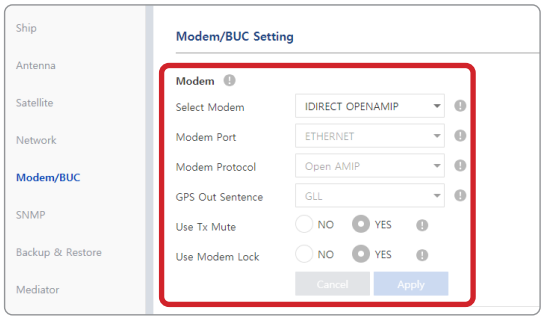
7.3 Modem Configuration

Before starting installation wizard, set up the modem configuration.

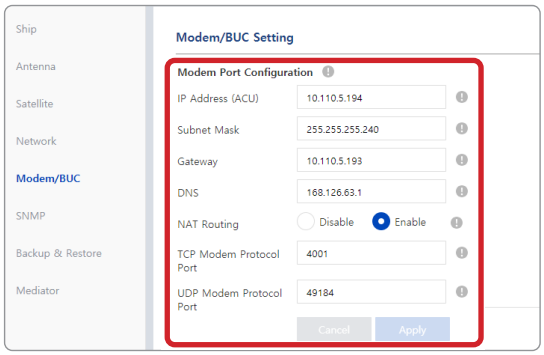
1. After accessing the ***AptusNX*** main page, go to **SETUP ➔ Modem** on the main menu.



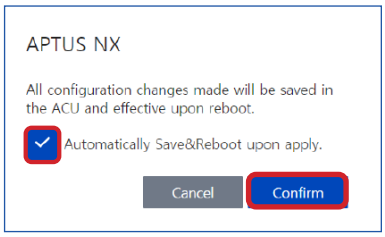
2. Select your modem type from the **Select Modem** drop-down list for loading a pre-configuration of modem. The setting parameters related to the modem interface will be set automatically once the modem type is selected. If you select **USER SETTING** from the **Select Modem** drop-down list, the settings can be changed manually. Click the **Apply** button.



3. Enter the modem setting values to configure the modem. Refer to the information provided by your service provider. Click the **Apply** button.



4. On the pop-up window, select the checkbox if you want the system to perform the **iARM Save & Reboot** automatically. Then, click the **Confirm** button.



5. Reboot the system.

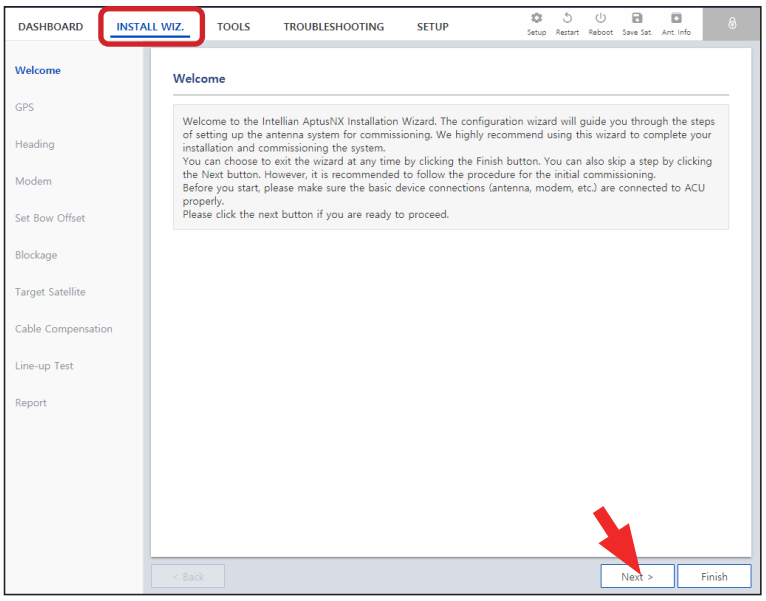
7.4 Starting Install Wizard

The Install Wizard will guide you through the steps of setup for the antenna system commissioning. We highly recommend using this wizard to complete the installation and commissioning of the system. You can exit the wizard at any time by clicking the **Finish** button. You can also skip steps by clicking the **Next** button. Before you start, make sure the basic devices (antenna, modem, etc.) are connected to the ACU properly. After accessing the ***AptusNX*** main page, go to the **INSTALL WIZ.** on the main menu then follow these steps.

NOTE

Refer to **"9.8.3 iARM Save & Reboot" on page 92** for detailed description of each function.

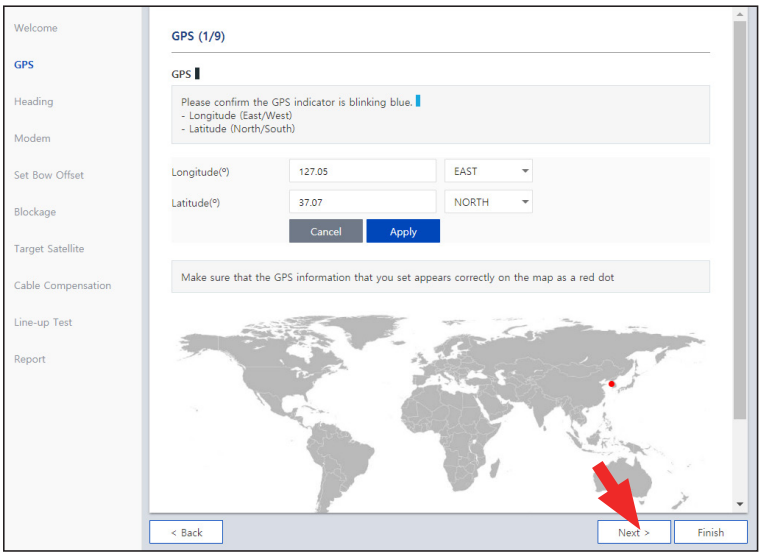
✓ Welcome Page



Welcome message is displayed.

Click the **Next** button.

✓ Step 1: GPS

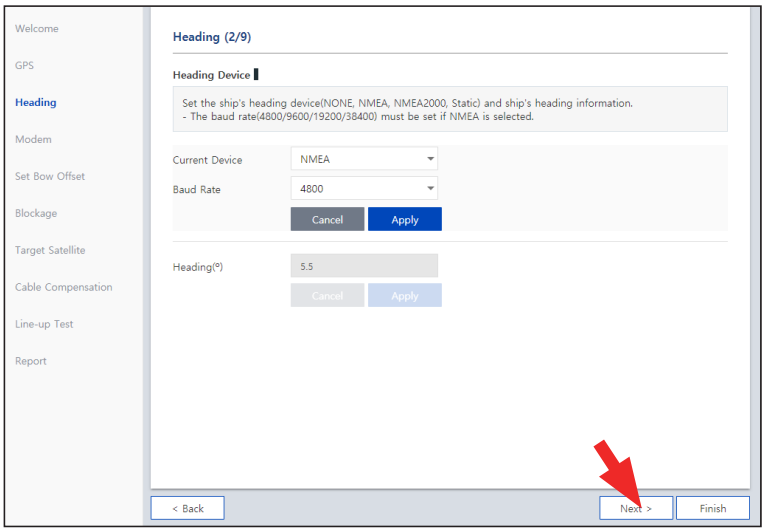


Set the GPS position of the vessel for the satellite searching. Check the GPS status connected to the antenna system. The colored indicator next to the title shows the GPS status. Make sure the GPS indicator is Blue (blinking).

- Blue (blinking): The system received a correct GPS signal.
- Red: The GPS signal is abnormal, or the received value is incorrect (Error).
- Black: The system has not received any GPS signal. You can enter the GPS value manually to set the GPS position.

Click the **Next** button to go to the next step.

✓ Step 2: Heading



Set the ship's heading device.

The colored indicator next to the title shows the heading device connection status.

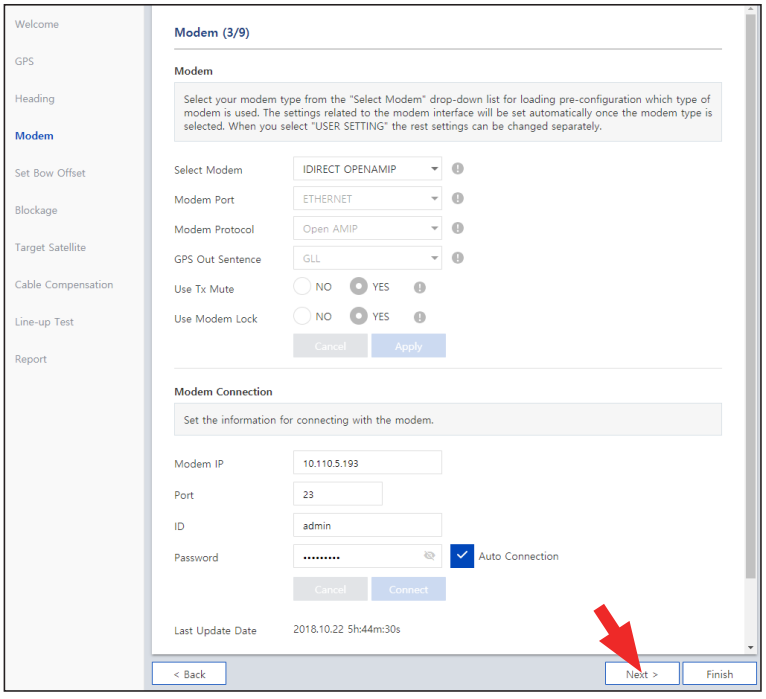
- Blue: Ship's heading device is connected.
- Black: Ship's heading device is not connected.

If a gyrocompass is connected, choose the device type from the **Current Device** drop-down list. Then, click the **Apply** button. If no gyrocompass is connected, choose **NONE**. Then, click the **Apply** button.

NOTE: Skip "Step 4: Set Bow Offset" if no gyrocompass is connected.

Click the **Next** button to go to the next step.

✓ Step 3: Modem



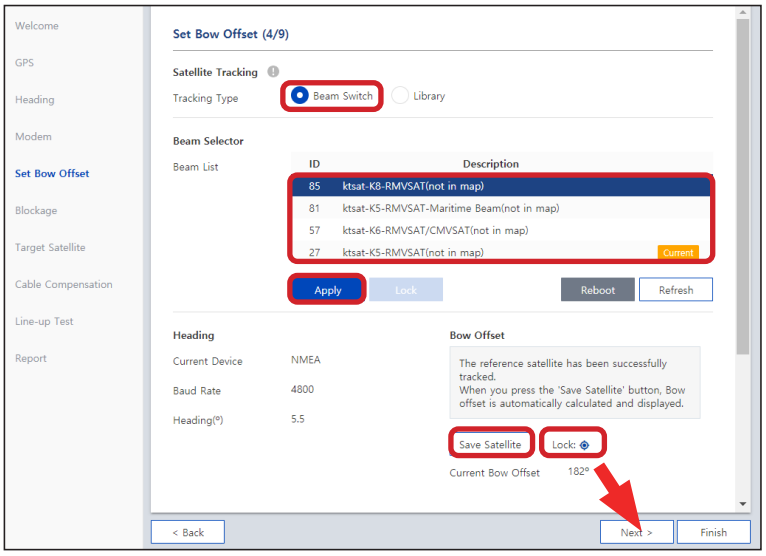
Select your modem type from the **Select Modem** drop-down list for the modem configuration. The setting parameters related to the modem interface will be set automatically once the modem type is selected. If you select **USER SETTING** from the **Select Modem** drop-down list, the settings can be changed manually.

Click the **Next** button to go to the next step.

✓ Step 4: Set Bow Offset

For setting BOW offset, select one of two satellite tracking types and a trackable satellite.

(Option 1: Using Beam Switch Type)



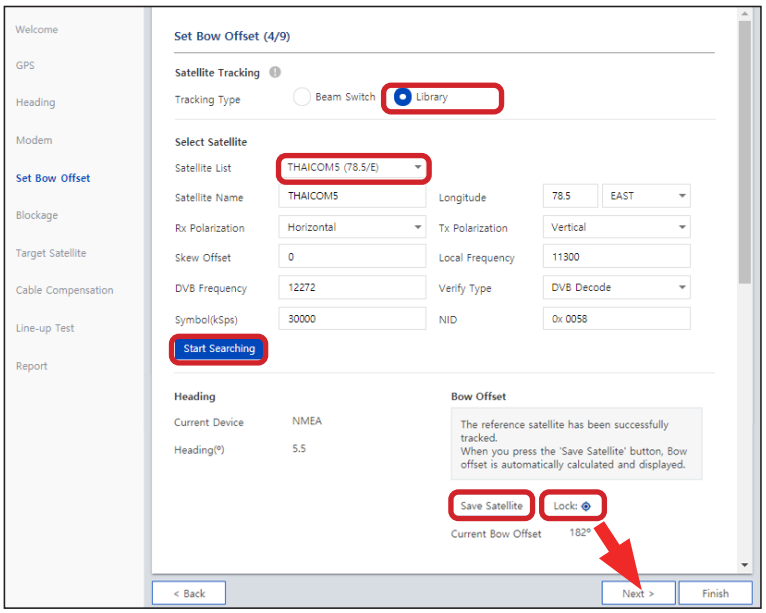
- **Step 1**: Choose the **Beam Switch** for the **Tracking Type**.
- **Step 2**: Select a satellite under the Beam List, then click the **Apply** button.

Wait while the antenna terminal tracks the satellite.

- **Step 3**: Make sure the **Lock** is on**,** then click the **Save Satellite** button in the **Bow Offset** menu to save the BOW offset information to ACU.

Click the **Next** button to go to the next step.

(Option 2: Using Library Type)



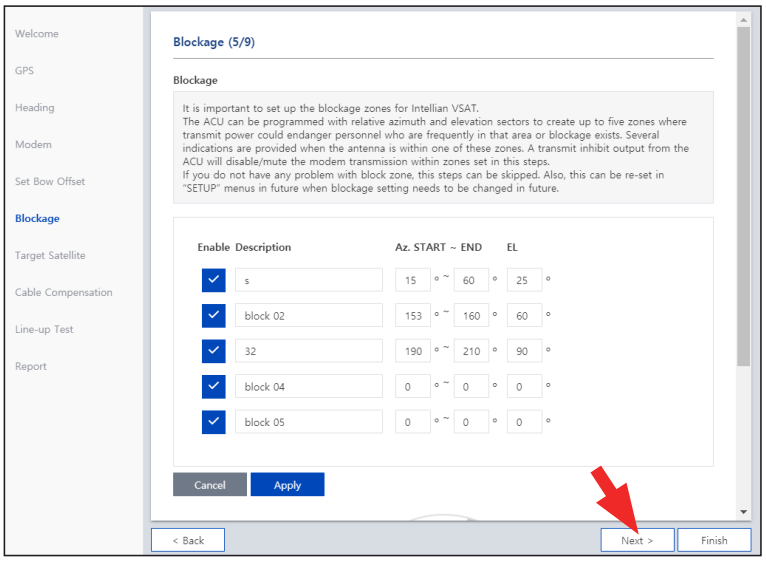
- **Step 1**: Choose the **Library** for the **Tracking Type**.
- **Step 2**: Select a satellite under the **Satellite List**, then click the **Start Searching** button.

Wait while the antenna terminal tracks the satellite.

- **Step 3**: Make sure the **Lock** is on**,** then click the **Save Satellite** button in the **Bow Offset** menu to save the BOW offset information to ACU.

Click the **Next** button to go to the next step.

✓ Step 5: Blockage



It is important to set up the blockage zones for Intellian VSAT. The VSAT system can be programmed with relative azimuth and elevation sectors to create up to five zones where transmission is muted. The **AZ START** is the relative azimuth angle where the blockage starts, and the **AZ END** is the relative azimuth angle where the blockage ends (Range: 0 ~ 360). The **EL** is the elevation angle where the blockage is set (Range: 0 ~ 90). The blockage is activated below the elevation angle.

Click the **Next** button to go to the next step.

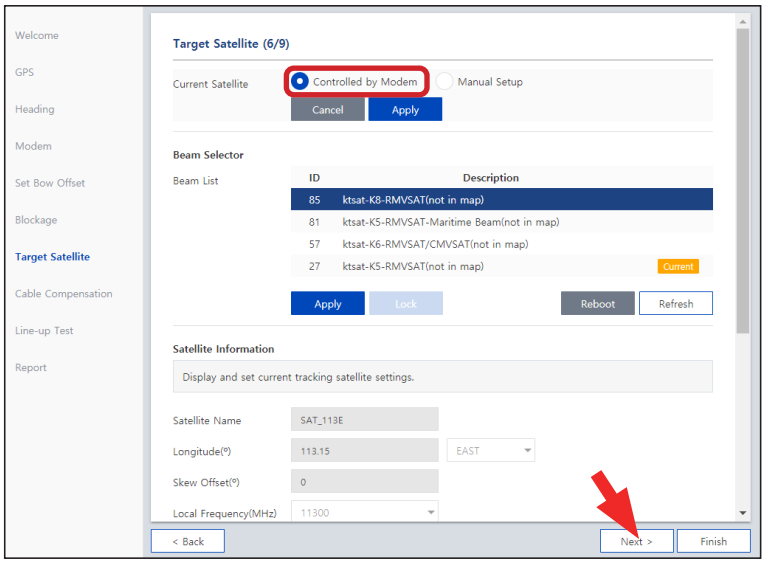
✓ Step 6: Target Satellite

Set the target satellite to track. There are two methods for selecting a target satellite.

NOTE

The following images in this step show when the system is using the Open AMIP modem.

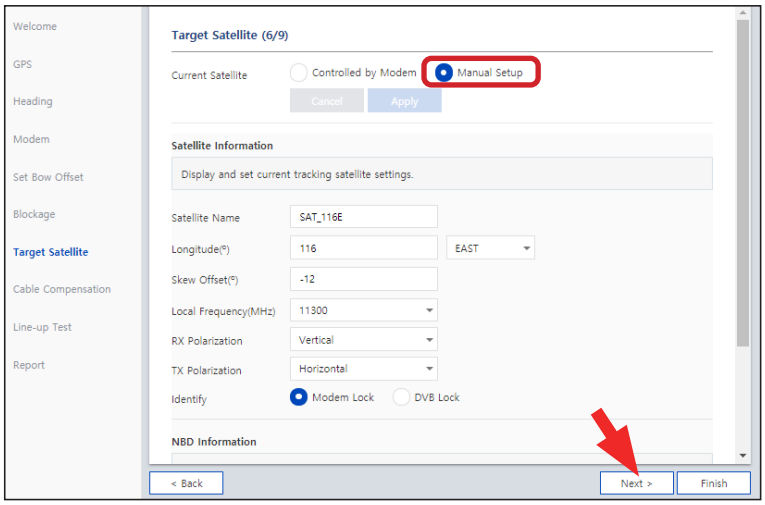
(Option 1: Using Satellite Controlled by Modem)



This method is generally recommended. After setting the modem connection in the **"Step 3: Modem"**, select the **Controlled by Modem** for the **Current Satellite**. Then, the current satellite and NBD information will be displayed automatically.

Click the **Next** button to go to the next step.

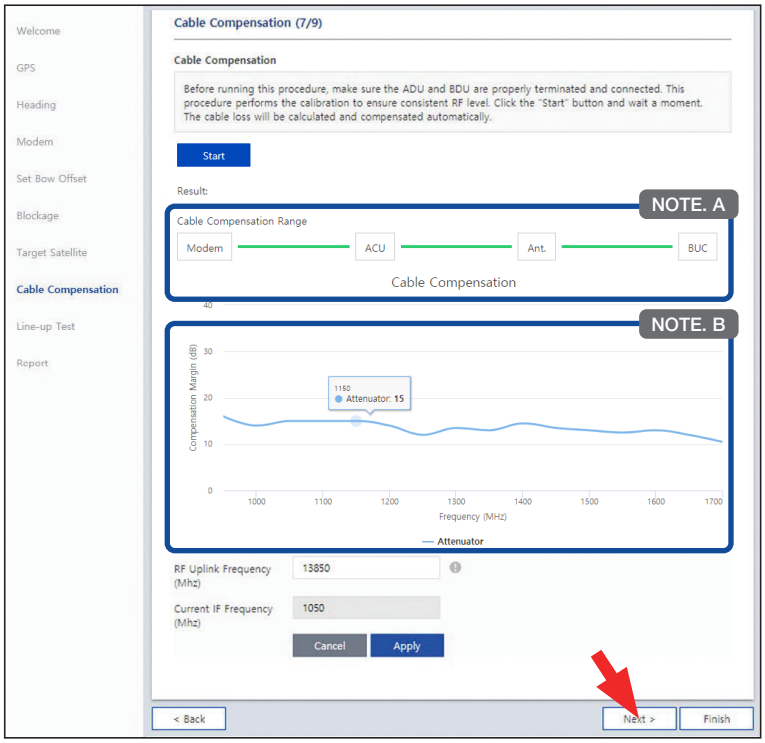
(Option 2: Using Manual Setup)



If you did not set the modem connection, select the **Manual Setup** for the **Current Satellite**. Then enter the satellite and NBD information manually to track a satellite. Click the **Apply** button.

Click the **Next** button to go to the next step.

✓ Step 7: Cable Compensation



Before running this procedure, make sure the ADU and BDU are properly terminated and connected. This procedure performs the calibration to ensure consistent RF level.

Click the **Start** button and wait for a moment. The cable loss will be calculated and compensated automatically. The progress of the cable compensation of a connected device is shown in Green. The result of the compensation is displayed as a graph. You can adjust the frequency value.

Click the **Next** button to go to the next step.

NOTE. A

The Cable Compensation Range is determined by the condition of installation (Modem, BUC). There exist four cases of cable compensation as follows.

Case	Modem*	BUC M&C**	Compensation Method	Compensation path
1	iDirect	O	IF signal Source: iDirect Output Power monitor: BUC M&C	Full path Calibration
2	iDirect	X	IF signal Source: iDirect Output Power monitor: Stacker	Exclude calibration: BUC
3	Not iDirect	O	IF signal Source: De-stacker Output Power monitor: BUC M&C	Exclude calibration: Modem to ACU Cable
4	Not iDirect	X	IF signal Source: De-stacker Output Power monitor: Stacker	Exclude calibration: Modem to ACU Cable, BUC

*Modem: iDirect X5, X7 Series which are able to access Telnet and support CLI.

**BUC: NJRC, Terrasat products which have M&C function.

NOTE. B

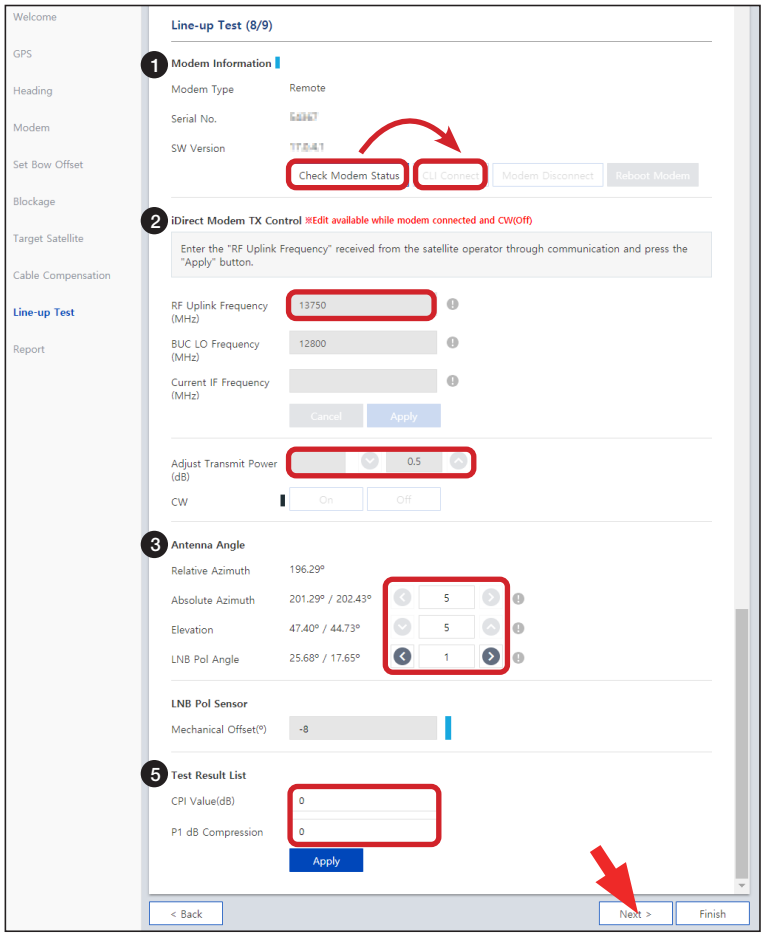
The Attenuator graph displays attenuator values corresponding to the frequency.

- Frequency Range: 950 ~ 1700 MHz (@ 50 MHz step)
- Attenuator Range: 0 ~ 31.5 dB

✓ Step 8: Line-up Test

Perform a line-up test by the satellite operator to confirm antenna performance and operation status.

(Option 1: Using iDirect Open AMIP Modem)



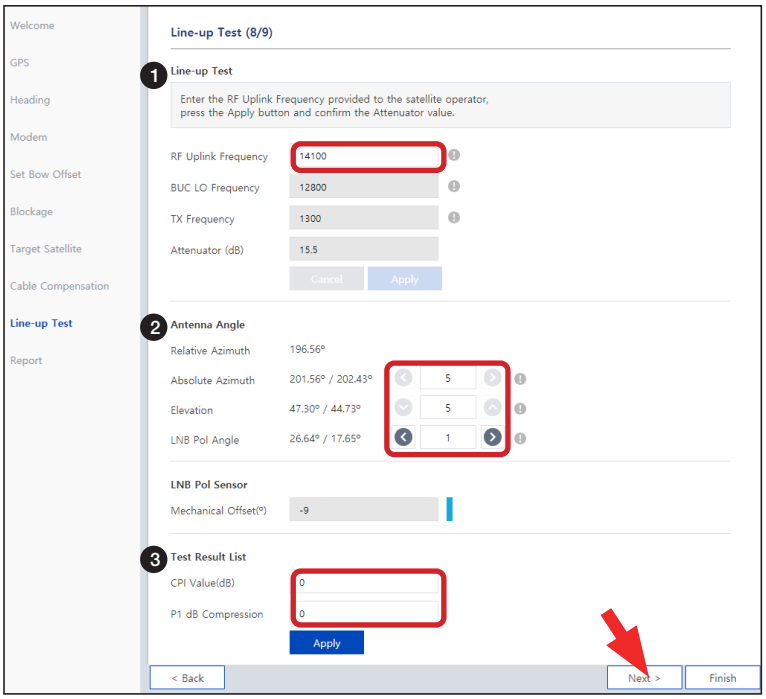
1. Check the modem status which is ready for the connection by clicking the **Check Modem Status** button. Then connect to iDirect Open AMIP modem by clicking the **CLI Connect** button.
2. Enter the **RF Uplink Frequency** provided by your satellite operator, then click the **Apply** button. ***This menu can be edited when the antenna is connected to iDirect Open AMIP modem and the CW is off.***
3. Adjust the **Transmit Power** of the frequency using the arrow keys which increases or decreases by 0.5 dBm.
4. Adjust the **Antenna Angle**.
5. Enter the **Test Result** value received from the satellite operator, then click the **Apply** button.

Click the **Next** button to go to the next step.

Refer to the following table for a detailed explanation of each menu.

No.	Item	Description
①	Modem Information	Checks the iDirect Open AMIP modem information. The indicator next to the title shows the device connection status. (Blue: The iDirect Open AMIP modem is connected. Black: The iDirect Open AMIP modem is not connected.) • Modem Type: Displays the type of iDirect Open AMIP modem. • Serial No.: Displays the serial number of the iDirect Open AMIP modem. • SW Version: Displays the software version of iDirect Open AMIP modem. - Check Modem Status: Before the CLI connection, check the modem status for connection readiness by clicking the **Check Modem Status** button. - CLI Connect : Connect to the iDirect Open AMIP modem by clicking the **CLI Connect** button. - CLI Disconnect: Disconnect from the iDirect Open AMIP modem by clicking the **CLI Disconnect** button.
②	iDirect Modem Tx Control	- Adjusts the modem frequency to receive optimal signal. This menu can be edited when the antenna is connected to the iDirect Open AMIP modem and the CW is off. Click the **Apply** button to apply the settings to the system. • RF Uplink Frequency (MHz): Enters the RF uplink frequency provided by your satellite operator. • BUC LO Frequency (MHz): The BUC LO frequency is applied automatically. The value is assigned according to the satellite band. • Current IF Frequency (MHz): The current IF frequency is applied automatically. The value is **RF Uplink Frequency** value - **BUC LO Frequency**. The following menus are performed to adjust the transmit power of the frequency. • Adjust Transmit Power: Adjust the power calibration value using the arrow keys which increases or decreases by 0.5 dBm. • CW: Turn on or off the modulation function (On or Off). The indicator next to the title shows the CW status. (Blue: CW is on. Black: CW is off.) To edit the details of the iDirect Modem Tx Control menu, you must keep this function off.
③	Antenna Angle	Adjusts the antenna angle to receive optimal signal. • Relative Azimuth: Displays the relative azimuth angle. • Absolute Azimuth: Adjust the absolute azimuth angle using the arrow keys. • Elevation: Adjust the elevation angle using the arrow keys. • LNB Pol Angle: Adjust the LNB Pol angle using the arrow keys.
④	LNB Pol Sensor	Displays the Mechanical Offset value of the LNB Pol Sensor. The indicator next to the title shows the LNB Pol Sensor status. (Blue: the LNB pol sensor is on. Black: the LNB pol sensor is off.) • Mechanical Offset: Displays the mechanical offset value of the LNB Pol Sensor.
⑤	Test Result List	Enters the test result value received from the satellite operator. • CPI Value (dB): Enter the CPI value. • P1 dB Compression: Enter the P1 dB compression

(Option 2: Using Other Modems)



1. Enter the **RF Uplink Frequency** provided by your satellite operator, then click the **Apply** button.
2. Adjust the **Antenna Angle**.
3. Enter the **Test Result** value received from the satellite operator.

Click the **Next** button to go to the next step.

Refer to the following table for a detailed explanation of each menu.

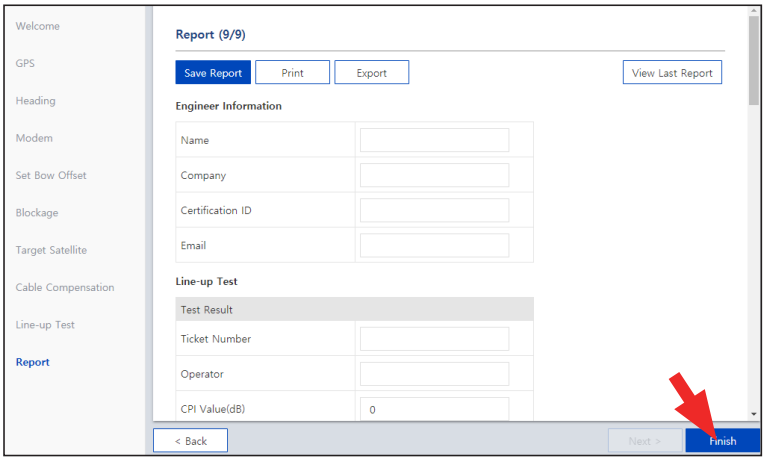
No.	Item	Description
①	iDirect Modem Tx Control	Adjusts the modem frequency to receive optimal signal. Click the **Apply** button to apply the settings to the system. • RF Uplink Frequency (MHz): Enters the RF uplink frequency provided by your satellite operator. • BUC LO Frequency (MHz): The BUC LO frequency is applied automatically. The value is assigned according to the satellite band. • Tx Frequency: The Tx frequency is applied automatically. The value is **RF Uplink Frequency** value - **BUC LO Frequency**. • Attenuator (dB): The attenuator is applied automatically.
②	Antenna Angle	Adjusts the antenna angle to receive optimal signal. • Relative Azimuth: Adjust the relative azimuth angle. • Absolute Azimuth: Adjust the absolute azimuth angle. • Elevation: Adjust the elevation angle. • LNB Pol Angle: Adjust the LNB Pol angle.
③	Test Result List	Enters the test result value received from the satellite operator. • CPI Value (dB): Enter the CPI value. • P1 dB Compression: Enter the P1 dB compression

✓ Step 9: Report

NOTE

The following image shows when the system is using the Open AMIP modem.

In case of using other modems, the displayed items on the Report may change.



The configuration report is displayed.

You can save the results to the ACU by clicking the **Save Report** button and download the report file (.json) by clicking the **Export** button. Click the **View Last Report** button to check the recently saved report information including the saved date and time.

After complete the steps, click the **Finish** button.

Chapter 8. Operating ACU

8.1 ACU Front Panel View

The following figure shows the features on the ACU front panel.

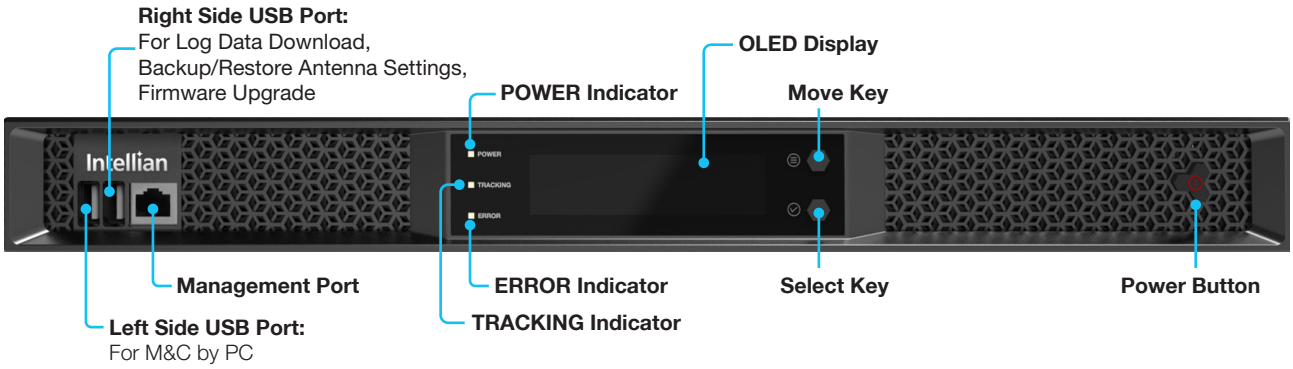


Figure 34: ACU Front Panel View

The following table describes the function of each touch key.

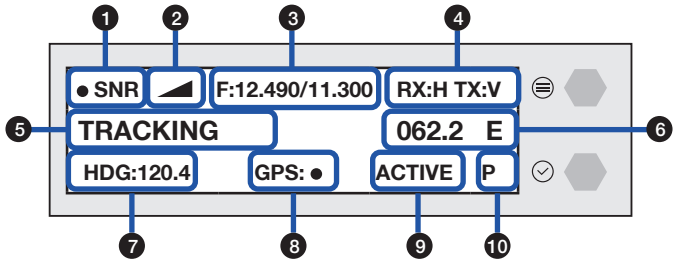
Touch key	Function
Power Button	Powers on/off the ACU.
Move Key	Moves to the desired screen.
Select Key	Selects the desired screen.

The following table describes status indicators on the ACU.

LED Display	Color	Description
POWER	Steady Green	The ACU is powered on.
	Off	The ACU is powered off.
ERROR	Steady Red	The antenna is in an error state.
TRACKING	Steady Green	The antenna is in tracking mode.

8.2 ACU Display Menu

The following figure shows the ACU display menu.

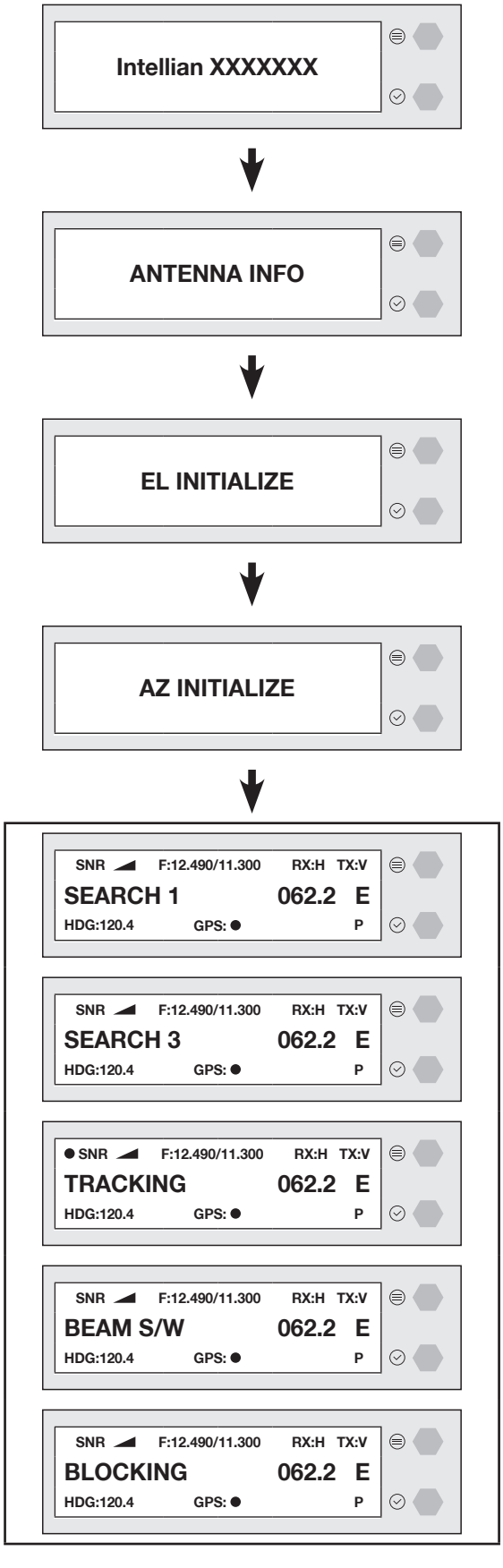


The following table shows the function of each touch key.

No.	Item	Description
①	Satellite Lock	Displays the satellite lock status.
②	Signal Level	Displays the antenna signal level.
③	Frequency Information (Target/LNB Local)	Displays the frequency information (Target / LNB Local).
④	Polarization	Displays the Rx/Tx polarization (H: Horizontal / V: Vertical).
⑤	Antenna Status	Displays the antenna status (TRACKING / SEARCHING / SETUP).
⑥	Target Satellite	Displays the target satellite (E: East / W: West).
⑦	Heading Information	Displays heading information (e.g., gyrocompass).
⑧	GPS Lock	Displays the GPS lock status.
⑨	Antenna Active State	***This function is available when using Dual Antenna System.*** Displays the antenna's active state. The active antenna (either primary or secondary antenna) is communicating (Tx/Rx) with a satellite. • ACTIVE: The active antenna is displayed as "ACTIVE" on the ACU screen.
⑩	Antenna Role Status	***This function is available when using Dual Antenna System.*** Displays the antenna's role as primary antenna or secondary antenna. • P (Primary): When running the primary ACU, which is connected to the modem and the gyrocompass, select the primary role. The primary ACU is assigned and operated as the primary antenna, which will communicate with the target satellite. • S (Secondary): When running the secondary ACU, select the secondary role. The secondary ACU is assigned and operated as the secondary antenna, which will be on standby and ready to assume primary antenna role to provide better service in the event of tracking failure or low signal level status.

8.3 Startup

After the system is installed and power is applied, the ACU display will show the following sequence.



✓ **Startup**

Intellian's model name is displayed.

✓ **Initialize Antenna Information**

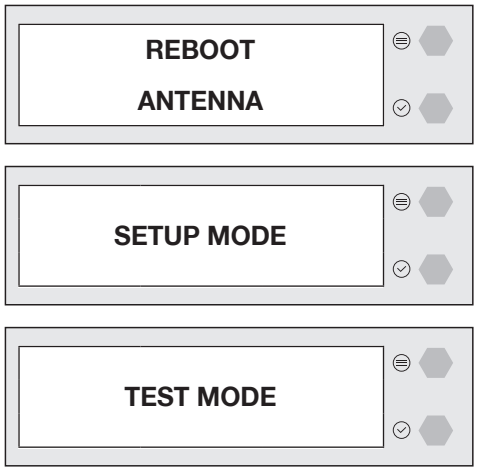
✓ **Initialize Elevation Angle**

✓ **Initialize Azimuth Angle**

✓ **Antenna's Status**

Displays SEARCH 1 (Global Search), SEARCH 3 (Local Search), TRACKING, Beam Switching, and BLOCKING.

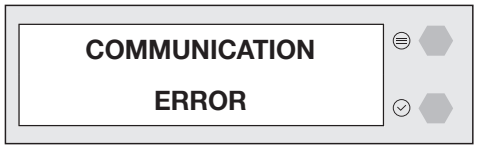
When the antenna is controlled by AptusNX, the ACU displays the control mode status.



✓ **Control Mode Status**

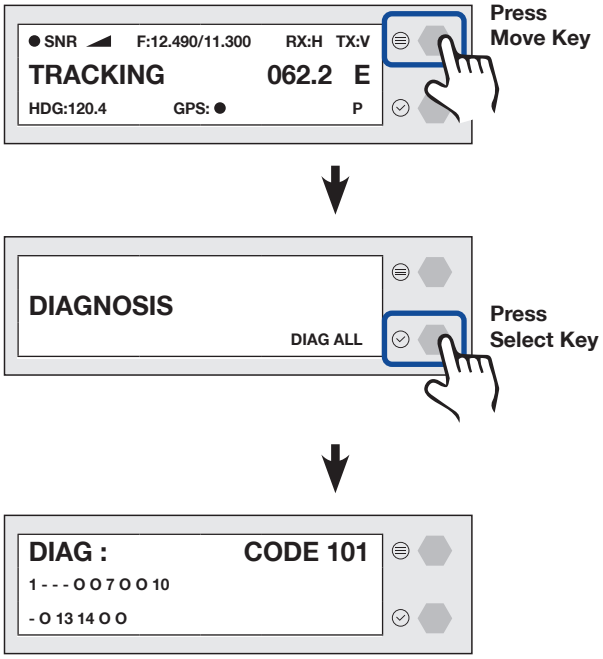
Displays REBOOT ANTENNA mode, SETUP MODE or TEST MODE.

If the antenna does not communicate with ACU, the **COMMUNICATION ERROR** is displayed.



8.4 Diagnosis

Executes antenna diagnosis tests and shows the real-time diagnosis results.

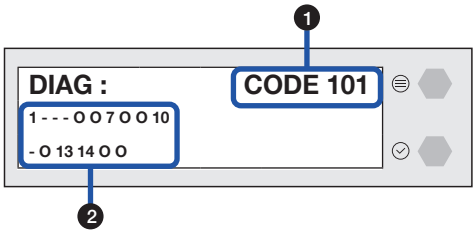


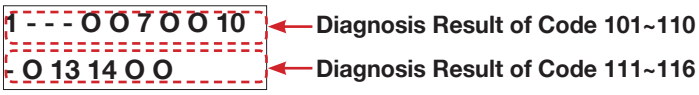
✓ **Main Display**

✓ **Diagnosis Display**

✓ **Diagnosis Result Display**

Refer to the diagnosis codes for the test results.

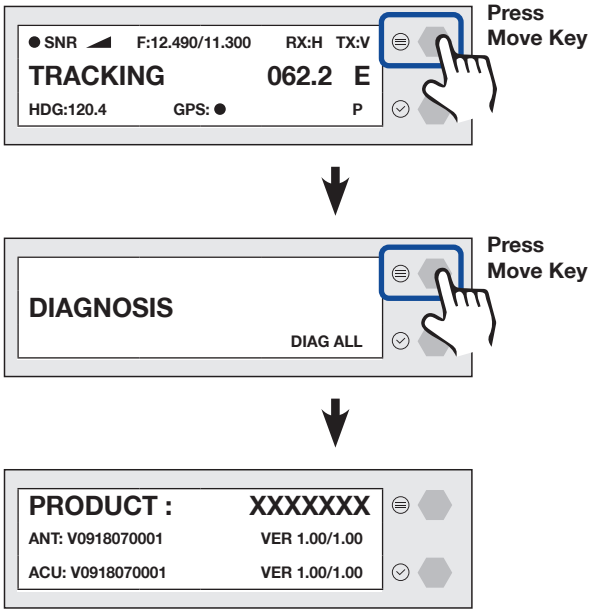


<table>
<tr><th>No.</th><th>Item</th><th>Description</th></tr>
<tr><td>①</td><td>Diagnosis Code</td><td>Displays the diagnosis code for the test that is currently running. When all tests are complete, DONE is displayed.
<table>
<tr><th>Code</th><th>Test</th></tr>
<tr><td>101</td><td>The data communication between the antenna and the ACU is tested.</td></tr>
<tr><td>102</td><td>The azimuth axis is tested.</td></tr>
<tr><td>103</td><td>The elevation axis is tested.</td></tr>
<tr><td>104</td><td>The cross-level axis is tested.</td></tr>
<tr><td>105</td><td>Not Available</td></tr>
<tr><td>106</td><td>Not Available</td></tr>
<tr><td>107</td><td>The rate sensor is tested.</td></tr>
<tr><td>108</td><td>Not Available</td></tr>
<tr><td>109</td><td>Not Available</td></tr>
<tr><td>110</td><td>The LNB / NBD is tested.</td></tr>
<tr><td>111</td><td>The LNB pol motor is tested.</td></tr>
<tr><td>112</td><td>Not Available</td></tr>
<tr><td>113</td><td>The antenna power is tested.</td></tr>
<tr><td>114</td><td>The ACU power is tested.</td></tr>
<tr><td>115</td><td>Not Available</td></tr>
<tr><td>116</td><td>The home sensor is tested.</td></tr>
</table></td></tr>
<tr><td>②</td><td>Diagnosis Result</td><td>• Below is an example of a diagnosis result:
 

• Each place in the results corresponds to the last one (codes 101 through 109) or two (codes 110 through 116) digits of a diagnosis code.
- If a dash (-) is displayed, the system passed the test. In the above example, the system passed the tests for codes 102, 103, and 104.
- If the last 1 or 2 digits of a diagnosis code are displayed, the system failed the test. In the above example, the system failed the tests for codes 101, 107, 110, 113, and 114.
- If O is displayed, the test was not performed. In the above example, the tests for codes 105, 106, 108, 109, 111, 112, 115 and 116 were not performed.</td></tr>
</table>

8.5 Antenna Information

Displays the Antenna/ACU serial number, PCU/STAB/ACU/i-ARM Version of the product.



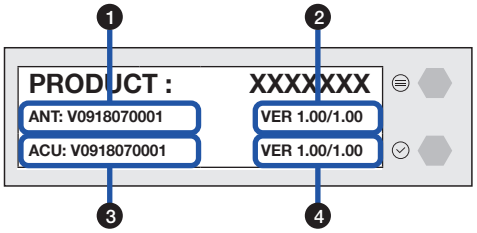
✓ **Main Display**

✓ **Diagnosis Display**

✓ **Antenna Information Display**

Product model name and antenna/ACU serial numbers are displayed.

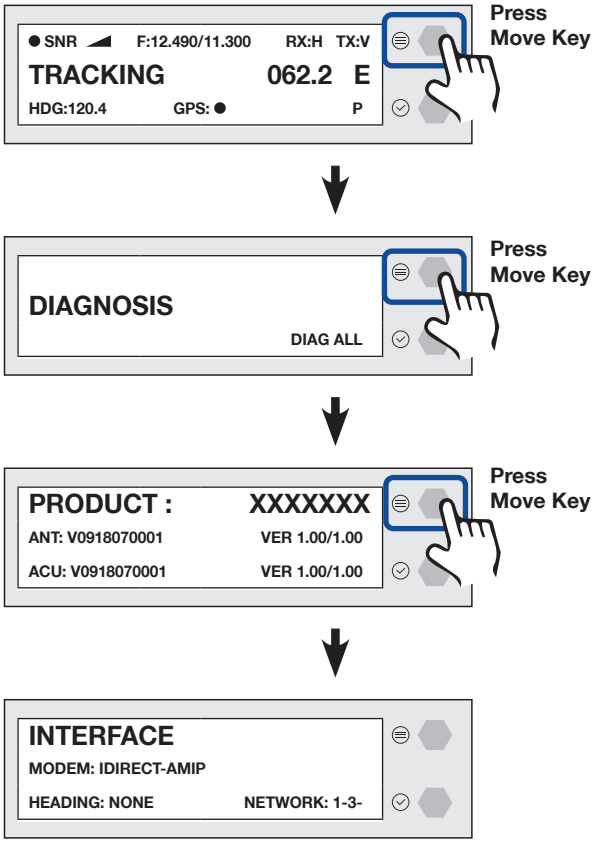
Refer to the Antenna Information display.



No.	Item	Description
①	Antenna Serial Number	Displays the Antenna serial number. The serial number is displayed depending on the product.
②	PCU Version/ STAB Version	Displays the PCU version / Stabilizer version.
③	ACU Serial Number	Displays the ACU serial number. The serial number is displayed depending on the product.
④	ACU Version/ i-ARM Version	Displays the ACU version / i-ARM version.

8.6 Interface Information

Displays the modem/heading type in use and the network connection status.



✓ **Main Display**

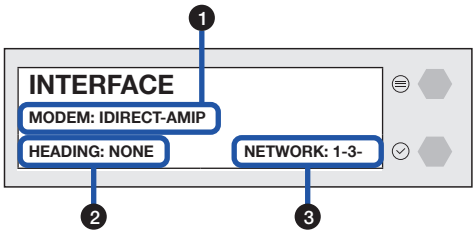
✓ **Diagnosis Display**

✓ **Antenna Information Display**

Product model name and antenna/ACU serial numbers are displayed.

✓ **Interface Information Display**

Refer to the Interface Information.



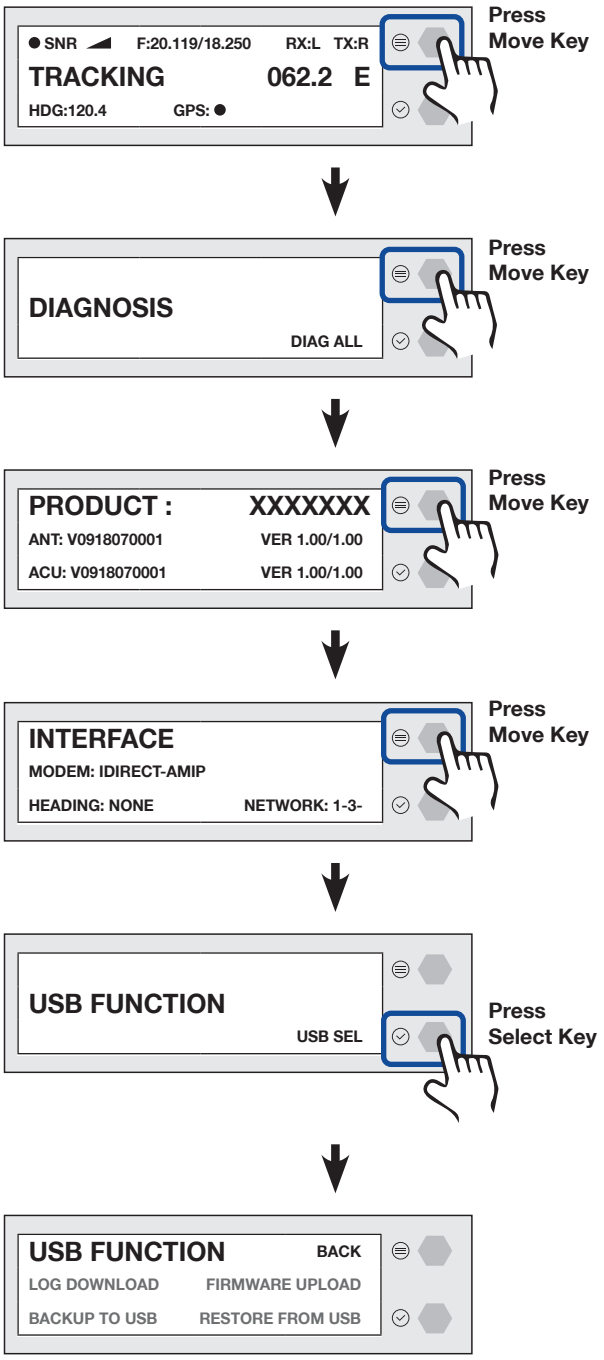
No.	Item	Description
①	MODEM	Displays the modem type in use. (IDIRECT-AMIP, SATLINK-SERIAL, IDIRECT I/O, SATLINK-VACP, NEWTEC AMIP, COMTECH I/O, ELEKTRIKOM AMIP, USER SETTING, COMTECH ROSS, GILAT-SE-II, HUGHES, IP STAR)
②	HEADING	Displays the heading type in use (NONE, NMEA0183, STATIC, NMEA2000).
③	NETWORK	Displays the network connection status with the ACU. • An example of network result: 1-3- - ' - ' : the network is not connected. - ' 1~4 ' : the number (1~4) of connected ACU port to network.

8.7 USB Function

To use this function, insert a USB flash drive into the right side USB port on the front panel of the ACU. The USB Function includes four menus (Log Download, Firmware Upload, Backup To USB, Restore From USB). Follow the sequence below to access the USB functions. For detailed information about each function, refer to the following subsections.

NOTE

The USB function is activated only when a flash drive is detected in the front panel USB port (right side).



✓ **Main Display**

✓ **Diagnosis Display**

✓ **Antenna Information Display**

Product model name and antenna/ACU serial numbers are displayed.

✓ **Interface Information Display**

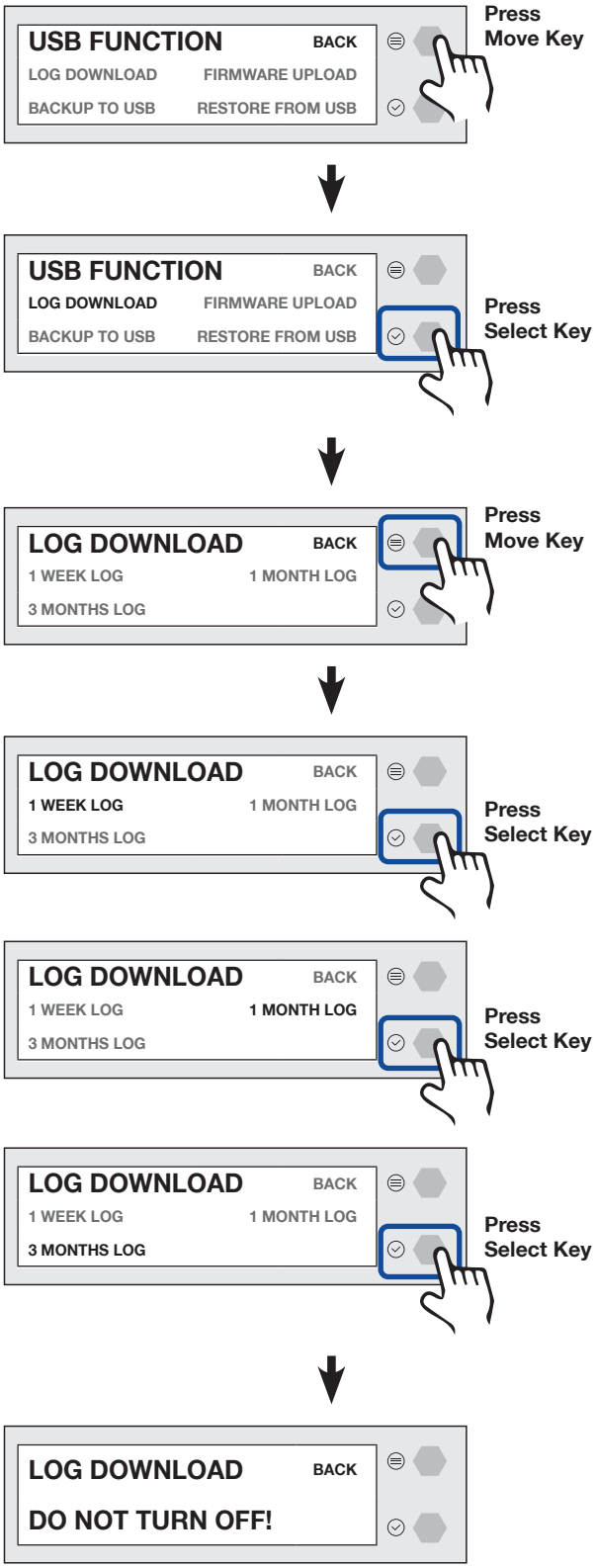
✓ **USB Function Display**

The USB function is activated only when a memory stick is detected on the front panel USB port (right side).

✓ **USB Function Menu Display**

8.7.1 Log Download

Downloads all data logs to the USB flash drive.



✓ **USB Function Menu Display**

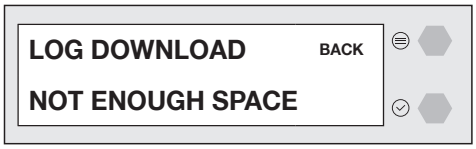
✓ **Log Download Menu Display**

✓ **Download Log File to USB**

Select one of three options: 1 WEEK LOG, 1 MONTH LOG or 3 MONTHS LOG.

✓ **Download Process Display**

If there is not enough free space on the USB drive, the **NOT ENOUGH SPACE** message is displayed.

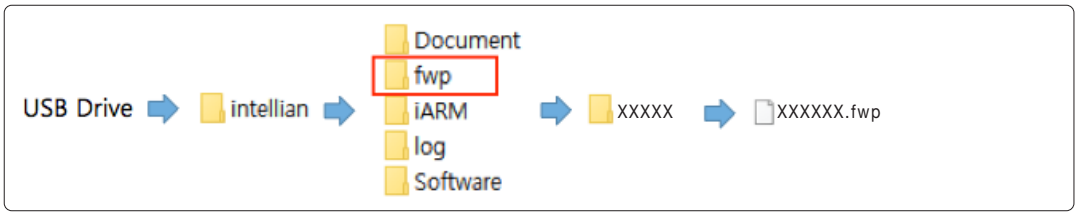


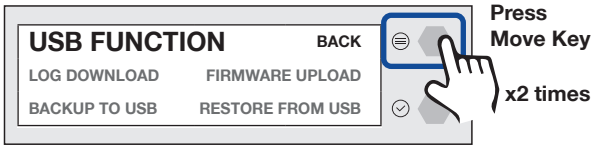
NOTE

If you want to go back to the previous screen, select the **BACK** option by pressing the **Select** key.

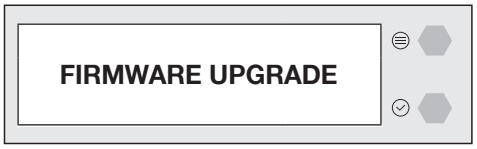
8.7.2 Firmware Upload

To use the Firmware Upload function, you must use the exact folder structure in the figure below. The function supports FAT32 or older formatted drives. You upgrade the antenna system by copying the FWP file to the /intellian/fwp folder on a USB flash drive. You also must rename the FWP file to XXXXX.fwp.





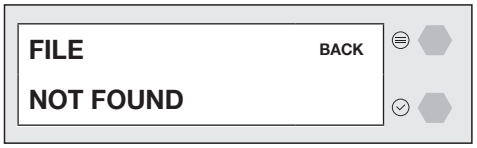
✓ **USB Function Menu Display**



✓ **Upgrade Firmware to Antenna System**

If the firmware file in USB is in invalid format, the **INVALID FILE FORMAT** message is displayed.

If any firmware file is not available on the USB drive with the correct name and in the correct file structure, the **FILE NOT FOUND** message is displayed.

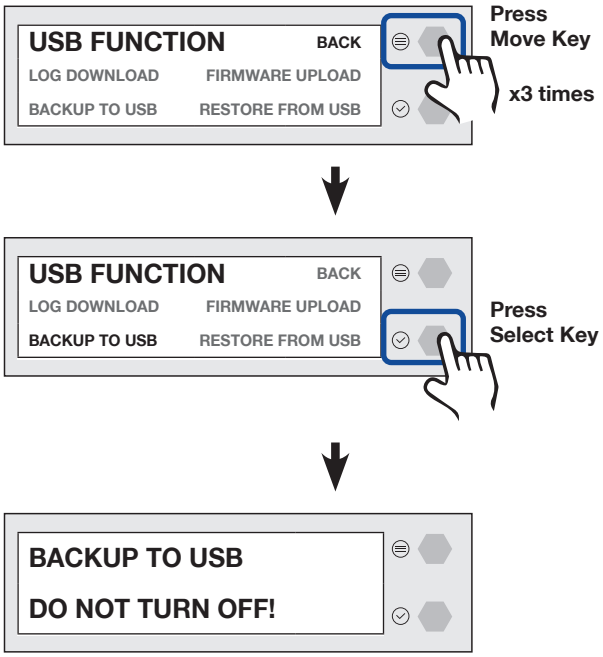


NOTE

If you want to go back to the previous screen, select the BACK option by pressing the Select key.

8.7.3 Backup to USB

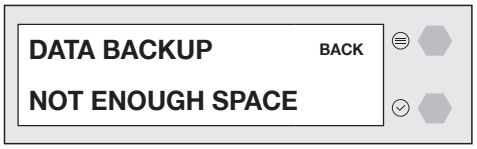
Backs up the antenna setting files to the USB flash drive.



✓ **USB Function Menu Display**

✓ **Back Up Antenna Setting Files to USB**

If there is not enough free space on the USB drive, the **NOT ENOUGH SPACE** message is displayed.

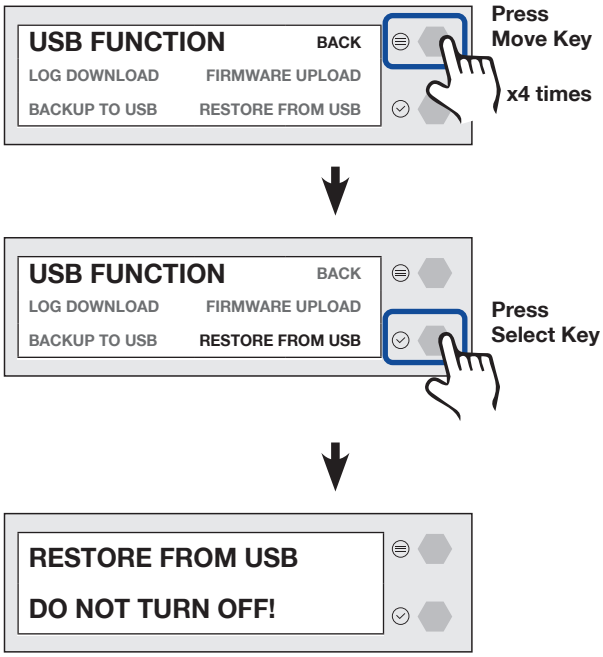


NOTE

If you want to go back to the previous screen, select the **BACK** option by pressing the **Select** key.

8.7.4 Restore From USB

Restores the antenna setting by using the setting files saved on the USB flash drive.



✓ **USB Function Menu Display**

✓ **Restore Antenna Setting files**

NOTE

If you want to go back to the previous screen, select the **BACK** option by pressing the **Select** key.

Chapter 9. Using AptusNX

9.1 Introduction

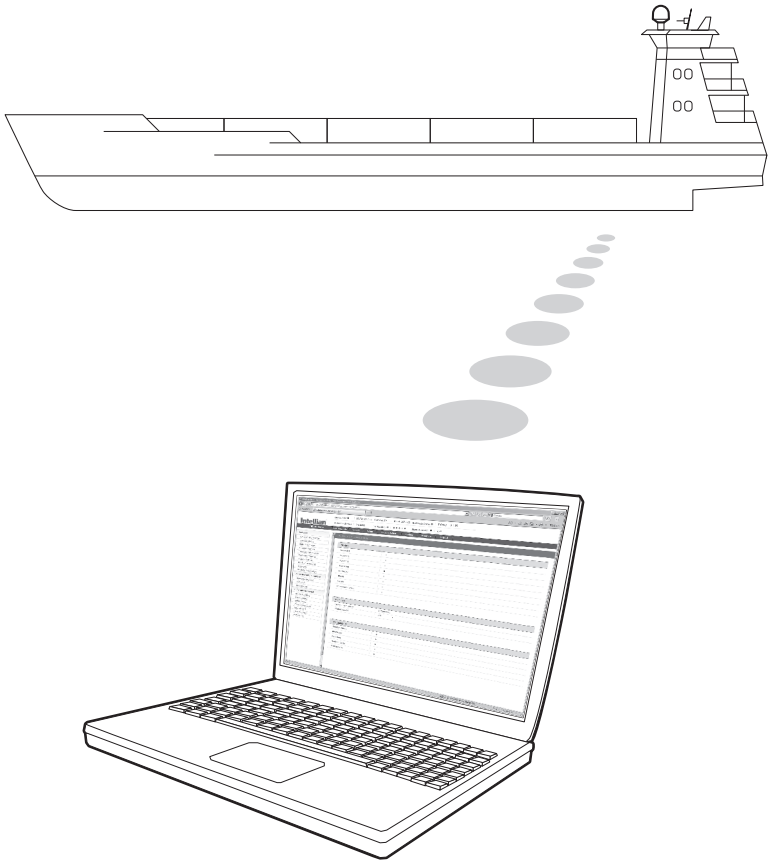
With the embedded ***AptusNX*** software, the antenna can be monitored, controlled, and diagnosed remotely from anywhere, anytime through TCP/IP protocol. This saves you the time and cost generated by various maintenance activities, such asupgrading firmware, tracking parameter resets, and diagnosing system issues.

9.2 Accessing AptusNX for ACU

1. Connect an Ethernet cable from the management LAN port on the front panel of the ACU to a LAN port of PC. This method is generally recommended.
2. Enter the ACU IP address (**Default: 192.168.2.1**) into the address bar of your web browser. The AptusNX Login page displays.

NOTE

AptusNX works on Internet Explorer 11 or higher (Windows 7 or higher editions), Firefox, Microsoft Edge and Chrome web browsers.

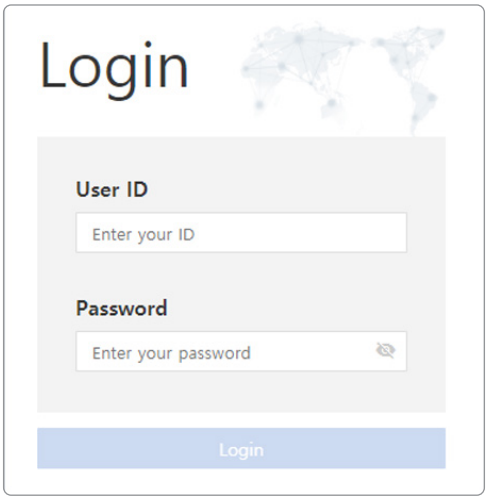


9.3 Main Page (Page Login)

The Intellian software Aptus provides different user access levels to protect the system for safe operation. Depending on the user level, the accessible functions in the software may be limited (see the table below).

Log into the ACU by typing in a User ID and Password. The table below contains the factory default values.

User Type	User ID	Password	Access Authority
Admin	***intellian***	***12345678***	All menus for monitoring and setting
	captain	***12345678***	All menus for monitoring and setting Assigns permissions to users
User	***guest***	***guest***	Limited menus for monitoring (Dashboard, Tools, Troubleshooting)

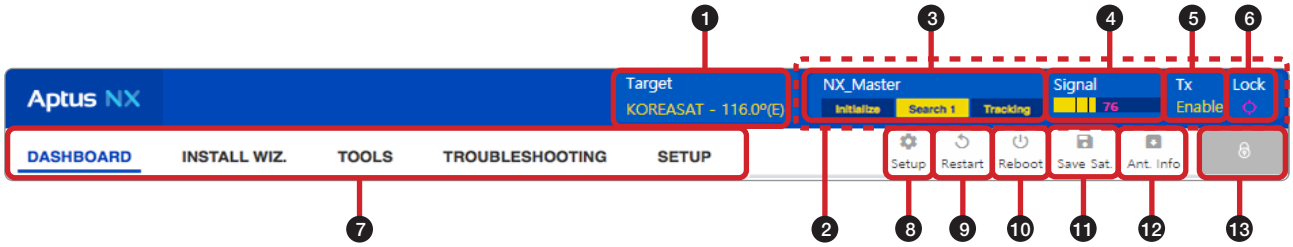


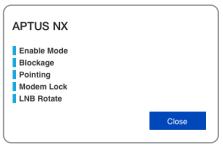
NOTE

After entering with the default password, the user must change the default password to a new password for security.

9.4 Top Menus

Once you log in, the following information and menus are displayed.



No.	Item	Description
①	Target Satellite	Displays the name of the targeted satellite.
②	Quick Status Screen Area	When clicking this top menu area (marked as red dots), the "Quick Status Screen" appears. You can quickly monitor each status of the five items (Enable Mode, Blockage, Pointing, Modem Lock, LNB Rotate) through the screen (Blue: enable, Black: disable).  <Quick Status Screen>
③	Antenna Status Info	Displays the antenna status/mode. • Initialize: The antenna system is initializing. • Searching: The antenna is searching for the target satellite. • Tracking: The antenna is tracking the target satellite.
④	Signal Level	Displays the current signal level using a yellow bar indicator. The length of the bar increases with signal strength.
⑤	Tx Status	Displays whether the antenna is able to transmit data or not.
⑥	Lock	Displays the satellite lock status. If the lock icon is lit green, the antenna has locked on the satellite.
⑦	Main Menu	Select a main menu item (DASHBOARD, INSTALL WIZ, TOOLS, TROUBLESHOOTING, SETUP). Each main menu item displays sub menus on the left of the screen.
⑧	Setup	Enter the setup mode to modify settings. The following functions are available only in setup mode.

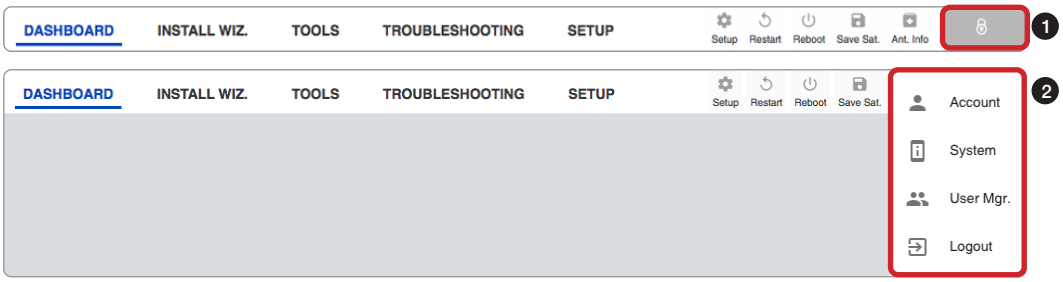
Main Menu	Side Menu	Function
SETUP	Antenna	Antenna Angle
		Dish Scan Range Check
		Sensor Calibration • Tilt Sensor Bias • Rate Sensor Bias
		Antenna Mode • Set Idle Mode
	Backup & Restore Setting	Antenna Restore

⑨	Restart	Exits the Setup mode and switches to the normal mode (Searching/Tracking mode).
⑩	Reboot	Powers off and restarts the antenna system. After system initialization, the antenna switches to normal mode (Searching/Tracking mode).
⑪	Save Sat.	Saves bow offset.
⑫	Ant. Info	Obtains current antenna information.

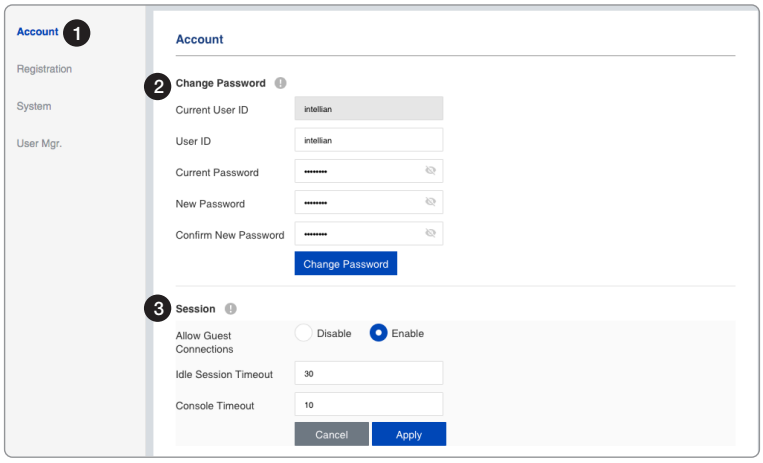
No.	Item	Description
⑬	Account Button	Click the button to manage the user account The **Account**, **System**, and **User Mgr**. menus are for user management. Click the **Logout** button to log out of the ***AptusNX*** web page.

9.5 Account Menu

1. Click the button to manage the user account.
2. Select **Account**, **System**, or **User Mgr.** for user management. Select **Logout** to log out of ***AptusNX***.

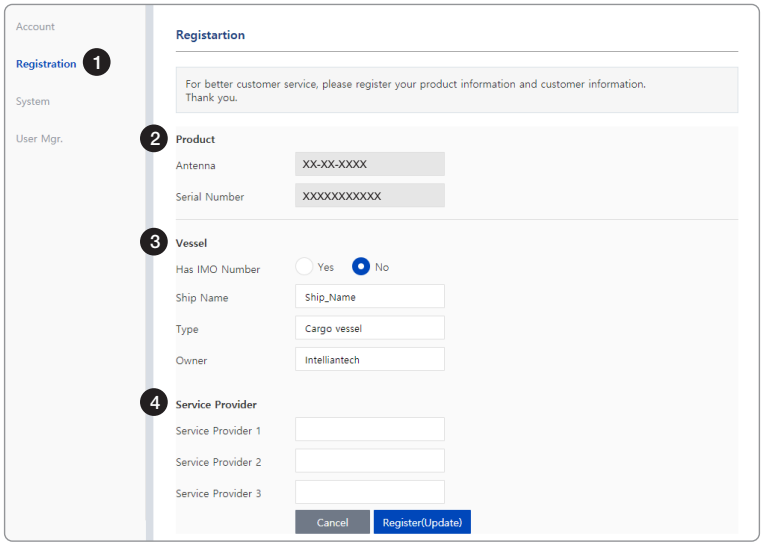


9.5.1 Account



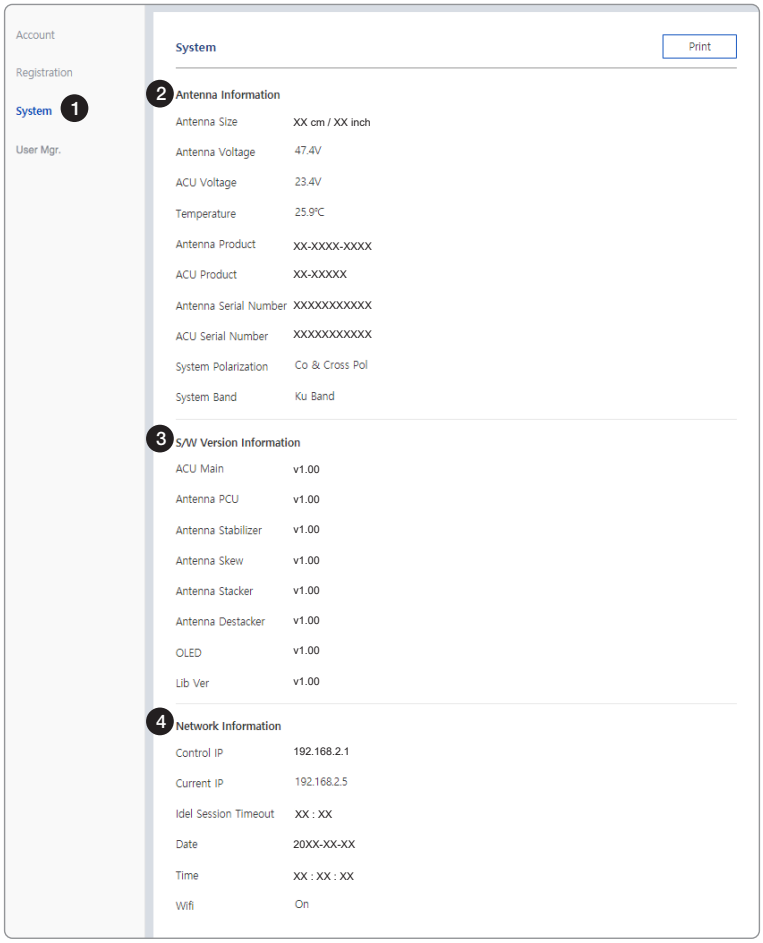
No.	Item	Description
①	Account	Updates your password and sets timeout.
②	Change Password	You can change your password. • Current User ID: Displays your user ID. • User ID: Enter the current user ID. • Current Password: Enter the current password. • New Password: Enter the new password. • Confirm New Password: Re-enter the new password to verify that it was entered correctly. Click the **Change Password** button to set the password to the new password. For the next login, the new password is required.
③	Session	You can give guests the accessibility to the AptusNX and set timeouts. • Allow Guest Connections: Select the guest's accessibility to the system (Disable / Enable). • Idle Session Timeout: Set the idle session timeout. • Console Timeout: Set the console timeout. Click the **Apply** button to apply the settings to the system.

9.5.2 Registration



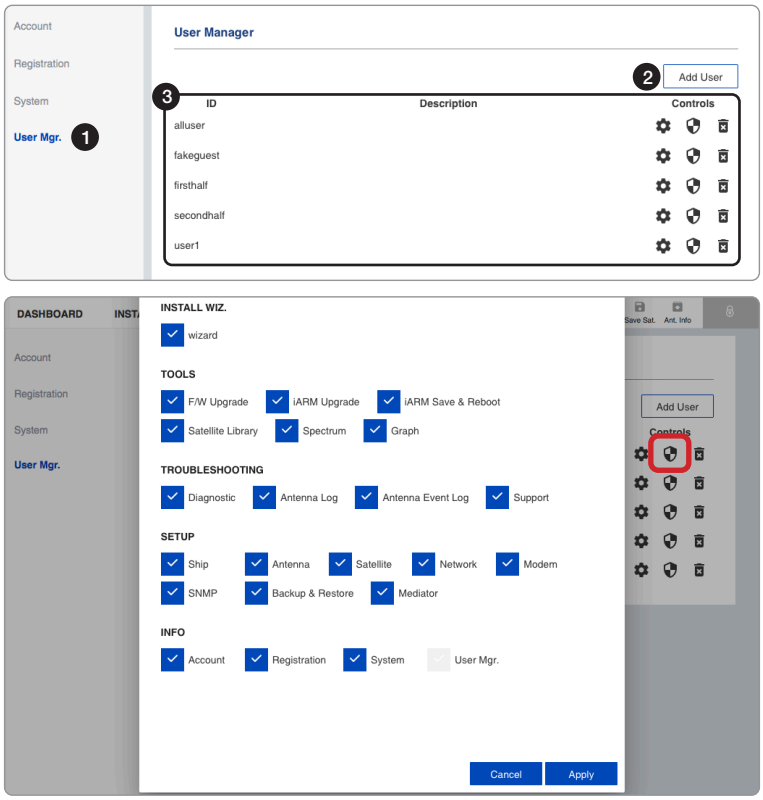
No.	Item	Description
①	Registration	Enter the product registration information for your convenience. Click the **Register (Update)** button to apply the settings to the system.
②	Product	Displays the antenna information. • Antenna: Displays the antenna name. • Serial Number: Displays the antenna serial number.
③	Vessel	Enter the vessel information. • Has IMO Number: Choose whether you have the IMO number or not. If you have the IMO number, select **Yes** and enter the number. If you do not have the IMO number, select **No** and enter the Ship Name, Type, and Owner information. • IMO Number: Enter the IMO number. • Ship Name: Enter the ship name. • Type: Enter the ship type. • Owner: Enter the owner's name.
④	Service Provider	Enter the information of your service provider. • Service Provider 1/2/3: Enter the names of service providers.

9.5.3 System



No.	Item	Description
①	System	Displays system information such as the antenna, S/W version, and network IP address.
②	Antenna Information	Displays antenna information.
③	S/W Version Information	Displays S/W version information.
④	Network Information	Displays network information.

9.5.4 User Manager

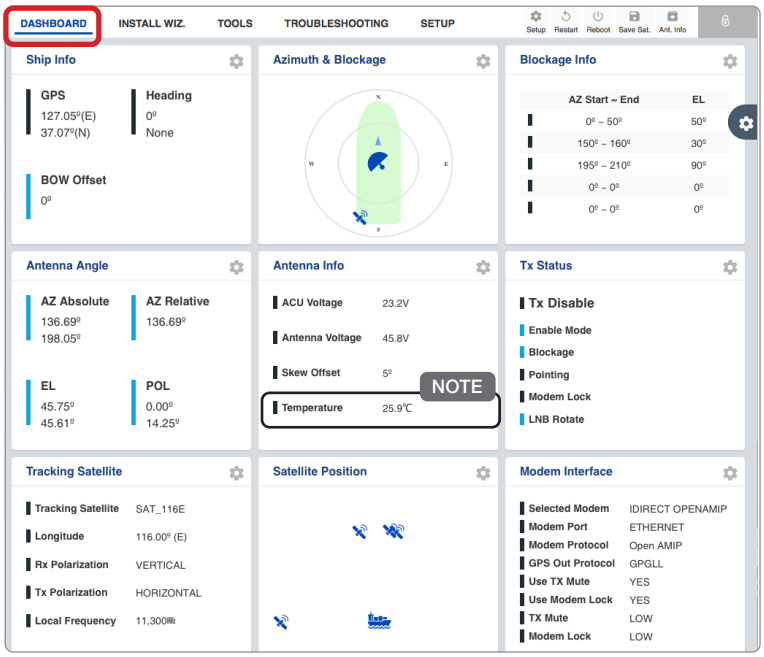


Editable User Permissions Menu

No.	Item	Description
①	User Manager	The captain with admin permissions can control and manage user permissions separately.
②	Add User	Creates new user accounts. To create a new user account, do the following: 1. Click the **Add User** button. The User Account window is displayed. 2. Enter the new user ID, Password, and Description (optional). 3. Under Menu Authorization, select the pages to which you want the user to have access. 4. Click the **Add User** button.
③	User Management List	Displays the user management state and can control and manage through the control buttons. • ID: Displays the registered user ID. • Description: Displays the user's description. • Controls: Click the control, and then select one of the following commands to manage the selected user account. - User Setting: Reset the user ID by clicking the **Update User** button, and changes the password by clicking the **Reset Password** button. - Edit Menu Permission: Choose user permissions to give by selecting the checkboxes, then click the **Apply** button. The user can access only the permitted options. - Delete User: Deletes the user.

9.6 Dashboard

The Dashboard menu item provides access to quick monitoring of the antenna status. Once displayed, the Dashboard helps you arrange panels on a single screen, while providing you with a broad view of a variety of information at once. You can customize the dashboard by rearranging the panels to make them more readable and user-friendly.



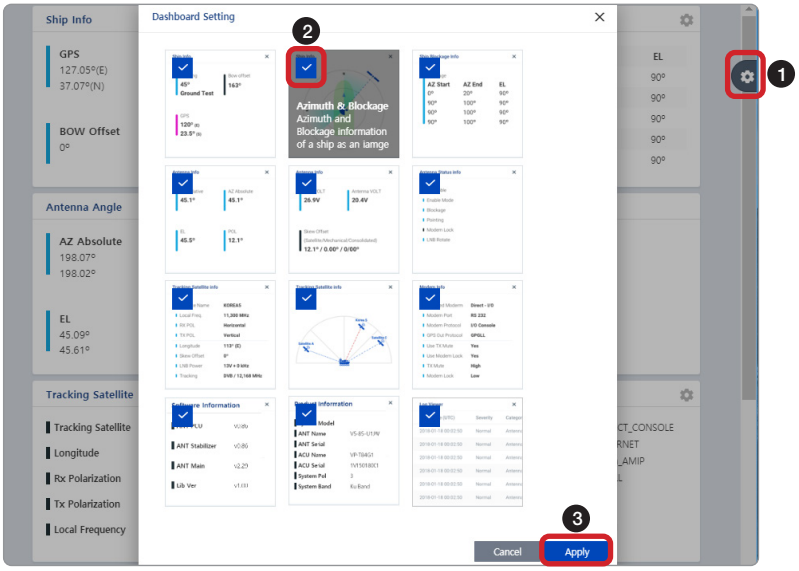
NOTE

In the BUC Info panel, the measured temperature can be different from the actual temperature.

9.6.1 How to Add & Remove Panels (Dashboard Setting)

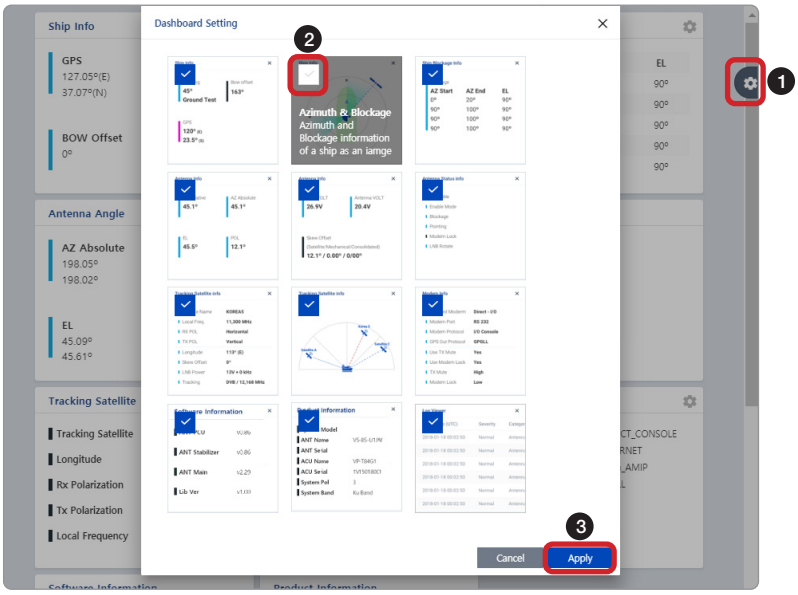
Adding Panels

1. Click the gear icon on the right side of the page (see figure below). The Dashboard Setting window displays.
2. Check the box of the panel that you wish to add to the dashboard.
3. Click the **Apply** button to apply the settings to the system. Once the panel is added, it will be automatically placed at the bottom of the page.



Removing Panels

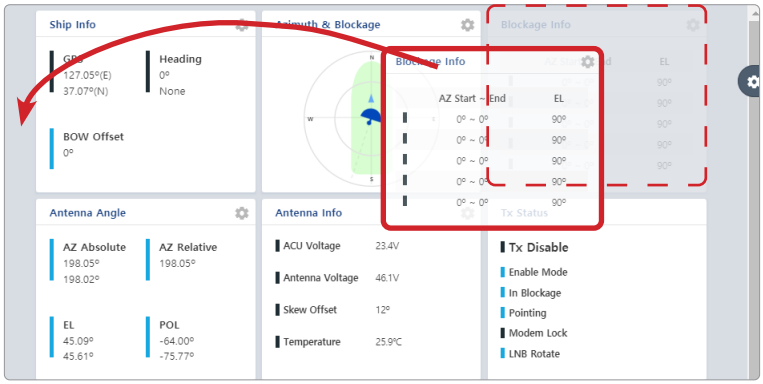
1. Click the gear icon on the right side of the page (see figure below). The Dashboard Setting window displays.
2. Uncheck the box of the panel that you wish to remove from the dashboard.
3. Click the **Apply** button to apply the settings to the system.



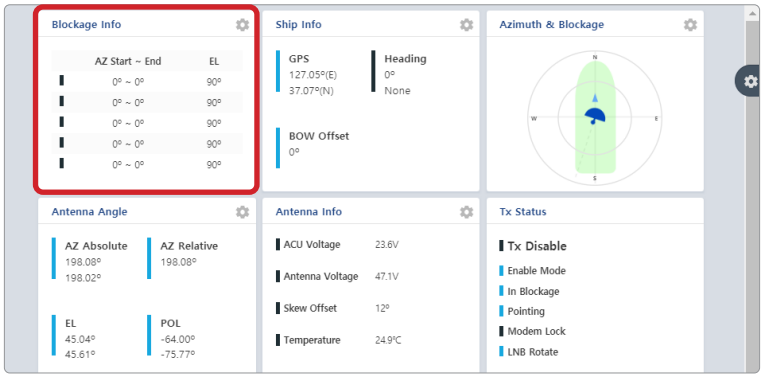
9.6.2 How to Arrange Dashboard Layout

You can customize the dashboard by rearranging panels as you wish.

1. Click and hold the left mouse button on a panel's title and then drag-and-drop in the desired position.



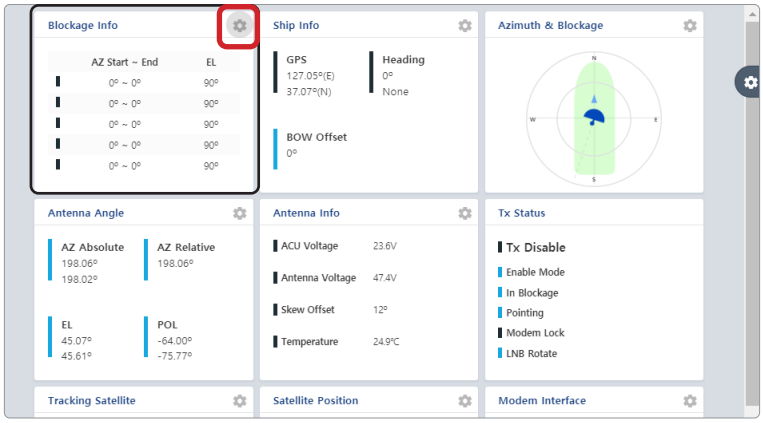
2. This time, the selected panel will be moved to the desired position. You can also move multiple panels into a customized layout in the same manner.



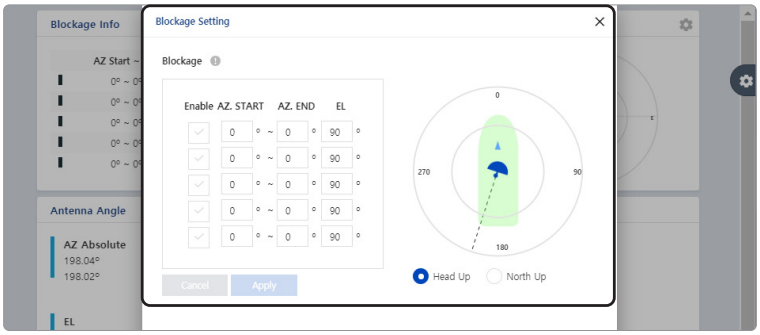
9.6.3 How to Use Shortcut Settings

Many panels on the dashboard provide a shortcut function. Using the **Shortcut** button on right side of the panel, you can easily access detailed information and manage settings.

1. Click the **Shortcut** button (⚙) to open the setting page.

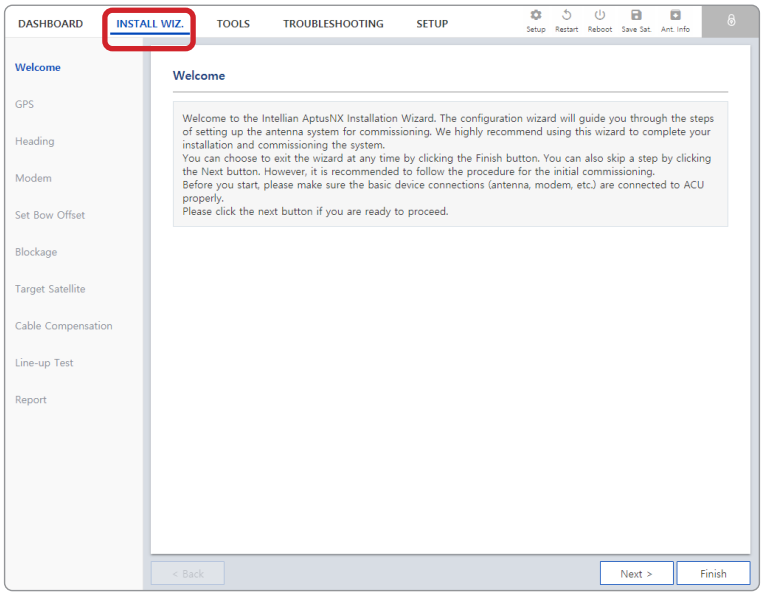


The setting page will appear on individualized web page. On settings pages, you can check the detailed information and quickly apply the settings that you wish.



9.7 Install Wizard

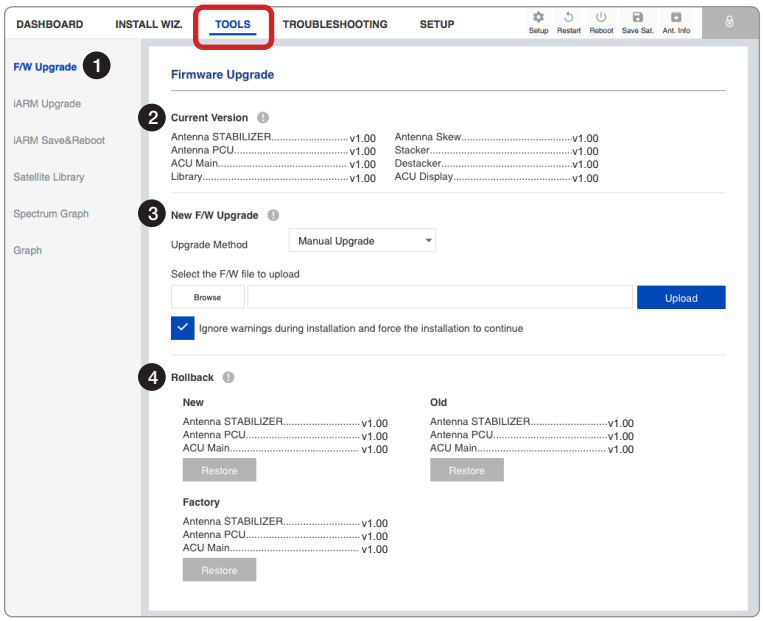
Refer to **"7.4 Starting Install Wizard" on page 54** for more details.



9.8 System Tools

This menu sets and displays the F/W Upgrade, iARM Upgrade, iARM Save&Reboot, Satellite Library, Spectrum Graph and Graph functions.

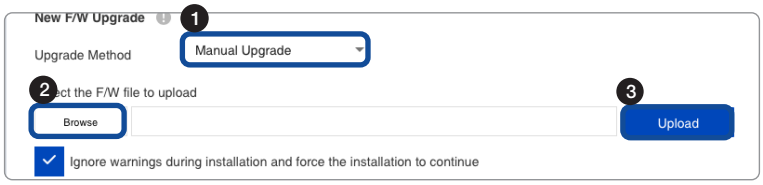
9.8.1 Firmware Upgrade



No.	Item	Description
①	Firmware Upgrade	Displays current firmware versions and upgrades antenna firmware.
②	Current Version	Displays current firmware versions (Antenna STABILIZER, Antenna PCU, ACU Main, Library, Antenna Skew, Stacker, Destacker, ACU Display)
③	New F/W Upgrade	Upgrades antenna firmware. The update may take a few minutes to complete. The upload time may vary due to a variety of factors such as the speeds of your network. Uploading an incorrect firmware file may cause serious damage to your antenna and ACU. Check firmware version before uploading firmware. Upgrade Method: Selects an upgrade method between **Manual Upgrade** or **Auto Upgrade**. **NOTE**: When using the **Manual Upgrade** method, refer to the following "**Antenna Firmware Update (Manual Upgrade method) Procedures**" page for more details.
④	Rollback	Displays the new, previous/latest, and factory default firmware package versions and allows you to rollback to them. • **New**: Most currently upgraded version of firmware • **Old**: Previous version of firmware before the upgrade • **Factory**: Initial version of firmware which was installed by the factory The new, old or factory version of firmware can be restored by clicking on the **RESTORE** button.

Antenna Firmware Upgrade (Manual Upgrade method) Procedure

1. Choose **Manual Upgrade** from the pull-down menu of **Upgrade Method**. **Browse** and , in the Windows Open dialog box, select the upgrade package file to upload.
2. Click on the **Upload** button to transfer the firmware package file ("*.fwp-in.) to iARM module.

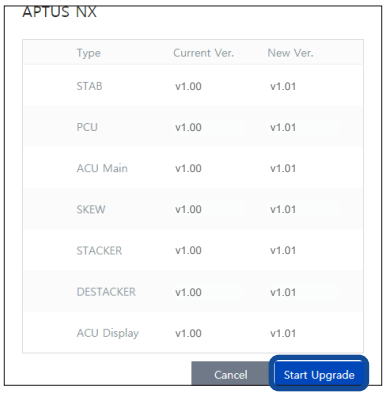


NOTE

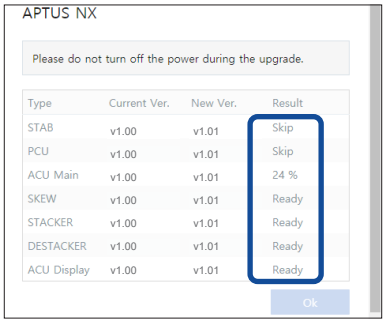
If you select the box "Ignore warnings during installation and force the installation to continue", warning messages do not appear during the upgrade.

The antenna firmware versions are displayed on the pop-up window.

3. Check the current version installed and the new version available, and then click the **Start Upgrade** button.

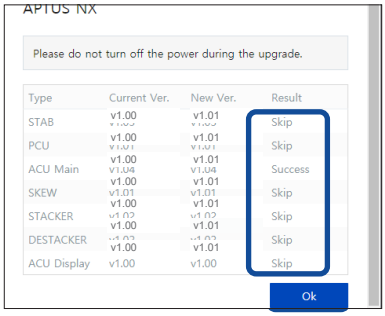


4. The upgrade process is displayed on the window.

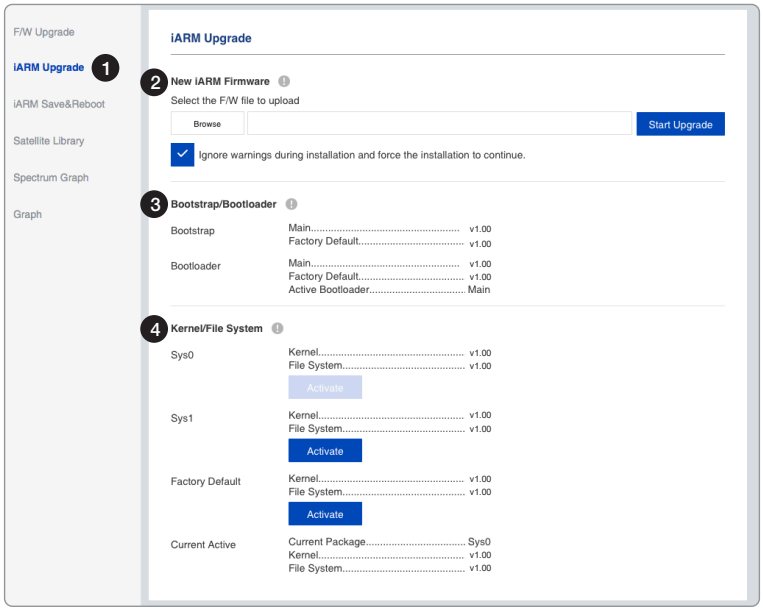


If the firmware is successfully upgraded, "Success" will be displayed in the Status column.

5. Click the **OK** button to close the pop-up window.



9.8.2 iARM Upgrade



No.	Item	Description
①	iARM Upgrade	Upgrades the firmware of iARM module.
②	New iARM Firmware	Browse and select the iARM firmware file to upload, and then click **Start Upload** button. The update may take a few minutes to complete. The upload time may vary due to a variety of factors, such as your network speed. Uploading an incorrect firmware file may cause serious damage to your antenna and ACU. Check the firmware version before uploading firmware. **NOTE**: Refer to the following **iARM Upgrade Procedure** for more details.
③	Bootstrap/ Bootloader	Displays current bootstrap and bootloader version. • Bootstrap: Displays the Bootstrap Version (Main, Factory Default). • Bootloader: Displays the Bootloader Version (Main, Factory Default, Active Bootloader)
④	Kernel/File System	The ACU has three storage partitions: the Sys0, the Sys1 and the Factory Default. Select the desired storage partition and click the **Activate** button. The currently active partition is unavailable for selection. Then perform the **"9.8.3 iARM Save & Reboot" on page 92** to apply the settings to the system. • Sys0: Displays the Sys0 version. • Sys1: Displays the Sys1 version. • Factory Default: Displays the Factory Default version. The **Current Active** displays activated storage part Information. • Current Active - Current Package: Displays the activated storage partition name (Sys0, Sys1 or Factory Default). - Kernel, File System: Displays the activated storage part's file version.

iARM Upgrade Procedure

1. Browse and, in the Windows Open dialog box, select the iARM firmware file (.tgz) that you wish to upgrade.
2. Click the **Start Update** button to update the iARM firmware. Wait until the page is loaded.

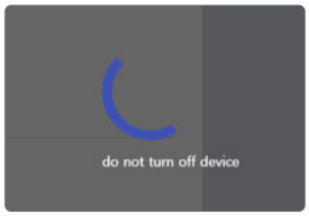
NOTE

If you select the box "Ignore warnings during installation and force the installation to continue", warning messages do not appear during the upgrade.

Once the update starts, the update process will be displayed on the screen. It will take about two minutes to complete the firmware upgrade.

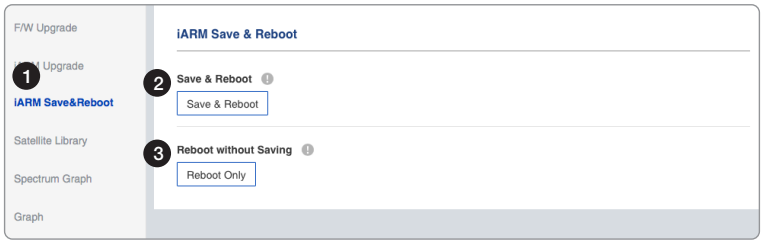
WARNING

Do not turn off the device if the firmware upgrade is in process. Failure to comply may lead to damage and/or malfunction of the system.



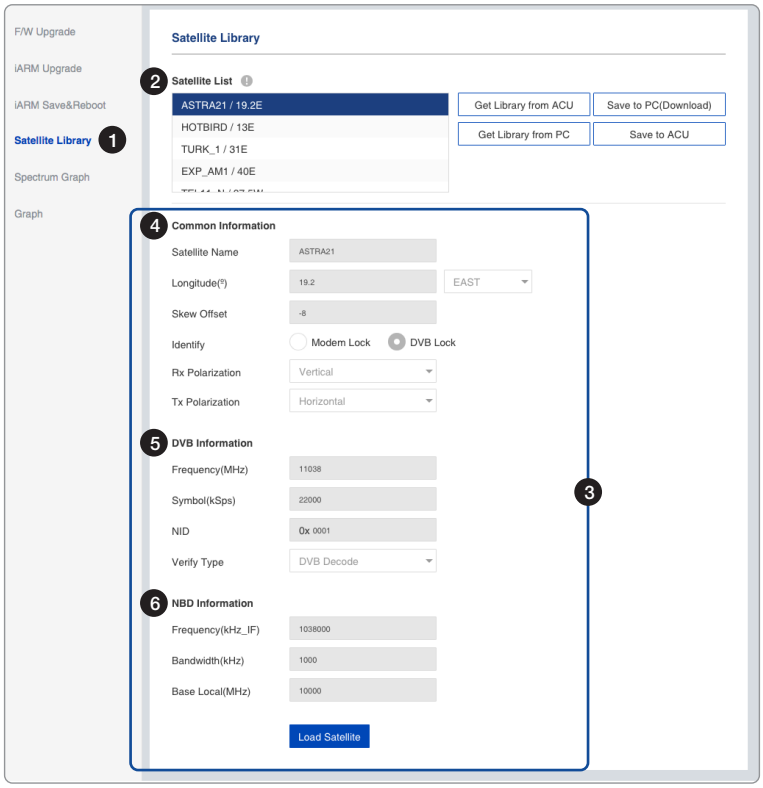
Once the upgrade is completed, the iARM module will automatically reboot in 10 seconds.

9.8.3 iARM Save & Reboot



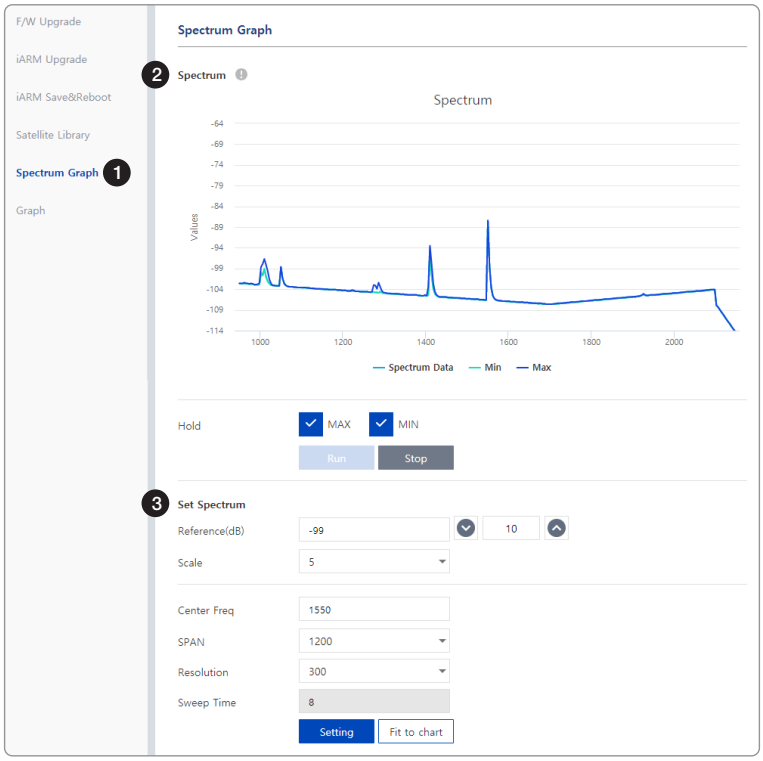
No.	Item	Description
①	iARM Save & Reboot	Saves settings to the ACU and reboot or reboot the system without saving.
②	Save & Reboot	Saves the modified settings for the iARM, and reboots the system. All configuration changes made will be saved in the ACU and effective upon the reboot. Click the **Save & Reboot** button.
③	Reboot without Saving	Reboots the system without saving the modified settings of the iARM . All configuration changes made will be lost upon the reboot. Click the **Reboot Only** button.

9.8.4 Satellite Library



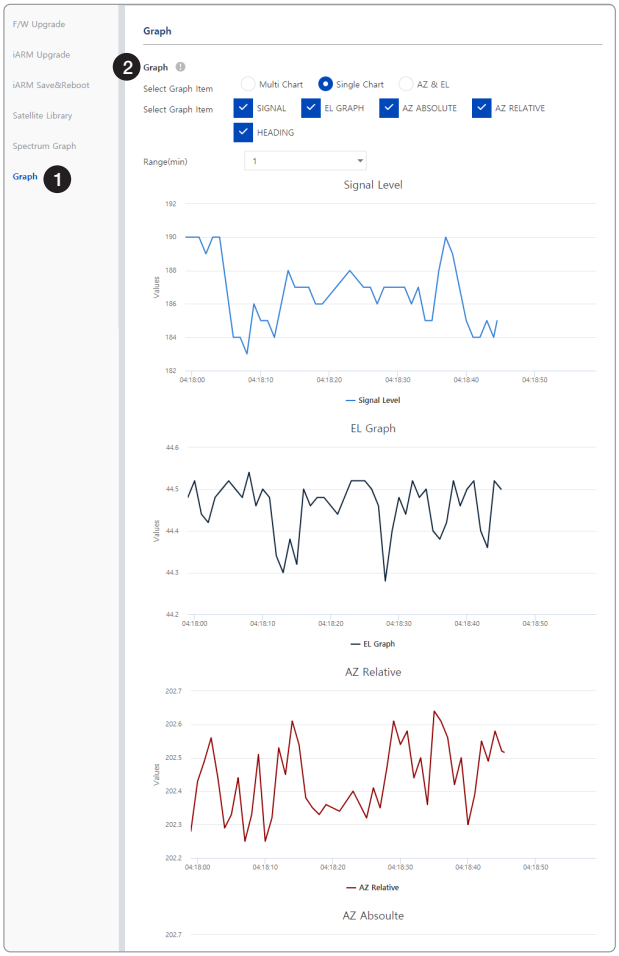
No.	Item	Description
①	Satellite Library	Sets the satellite library information.
②	Satellite List	Reads or manages satellite information from the library. • Get Library from ACU: Obtains satellite library file from the ACU. • Get Library from PC: Obtains the satellite library file from the PC. • Save to PC (Download): Saves the current library file to the PC. • Save to ACU: Saves the current library file to the ACU.
③	Satellite Information	Select one of the satellites in the **Satellite List** then Click the **Load Satellite** button to load the satellite information.
④	Common Information	Displays selected satellite information. • Satellite Name: Displays the satellite name. • Longitude(°): Displays satellite orbit position. • Skew Offset: Displays the Skew offset. • Identify: Displays the lock setting type (Modem Lock / DVB Lock) for satellite tracking. • Rx Polarization: Displays the current Rx polarization. • Tx Polarization: Displays the current Tx polarization.
⑤	DVB Information	Displays DVB mode's tracking information. • Frequency (MHz): Displays the tracking frequency. • Symbol (kSps): Displays the symbol rate. • NID: Displays the network ID. • Verify Type: Displays the verification type.
⑥	NBD Information	Displays NBD mode's tracking information. • Frequency (kHz_IF): Displays the tracking frequency. • Bandwidth (kHz): Displays the detection bandwidth. • Base Local (MHz): Displays the base local.

9.8.5 Spectrum Graph

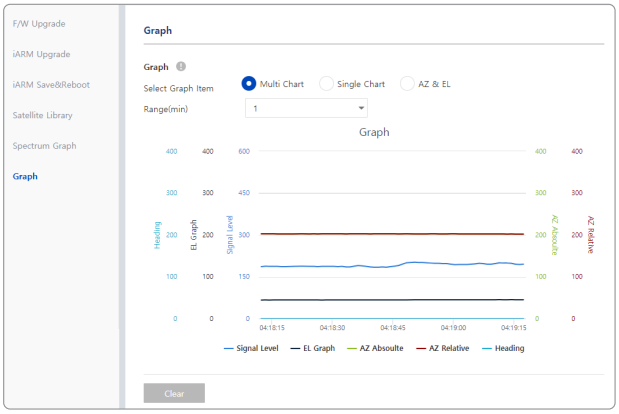


No.	Item	Description
①	Spectrum Graph	Displays a spectrum analyzer, measures an input Rx signal frequency within the full frequency range, and sets spectrum data view options. The disconnect fault can be checked and solved through spectrum analyzer results.
②	Spectrum Graph	Displays measurement results. The display of a spectrum analyzer has the frequency on the horizontal axis and the amplitude displayed on the vertical axis. • Hold: Displays the minimum/maximum value of the frequency band on the graph. - Max: Display the maximum value of the frequency band by clicking the check button. - Min: Display the minimum value of the frequency band by clicking the check button. • Run: Requests the spectrum data to antenna continuously and update graph data in real-time. • Stop: Stops requesting the spectrum data. (The graph cannot be updated.)
③	Set Spectrum	Sets detailed options for the spectrum graph. • Reference/Scale: Sets Amplitude Reference Level and Scale. Adjust the Reference Level using the arrow keys, or type in the values (-2000 to +2000) in the box. Select the Scale value(1, 2, 5, or 10 dB) from the drop-down list. • Center Freq.: Enters the Center Frequency value. • Span: Select the span value (6, 60, 300, or 1200 MHz) from the drop-down list. These numbers facilitate a zoom-in, zoom-out feature. • Resolution: Select the resolution value (100, 200, 300, or 600) from the drop-down list. These numbers facilitate a zoom-in, zoom-out feature. • Sweep Time: Displays the elapsed time all data received during the start to stop testing interval. Click the **Setting** button to apply the settings to the graph. If you click the **Fit to chart** button, the reference and scale value are automatically adjusted for the graph.

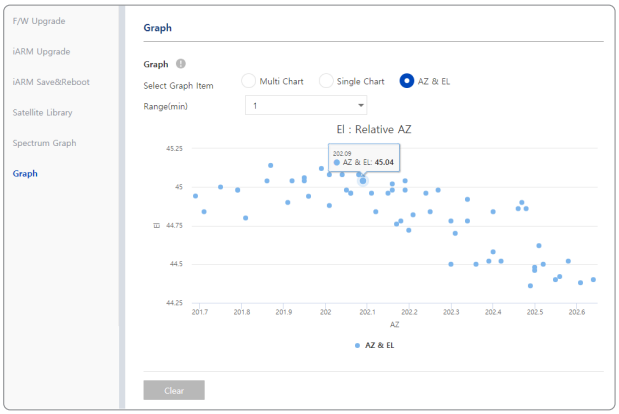
9.8.6 Graph



Single Chart View



Multi Chart View



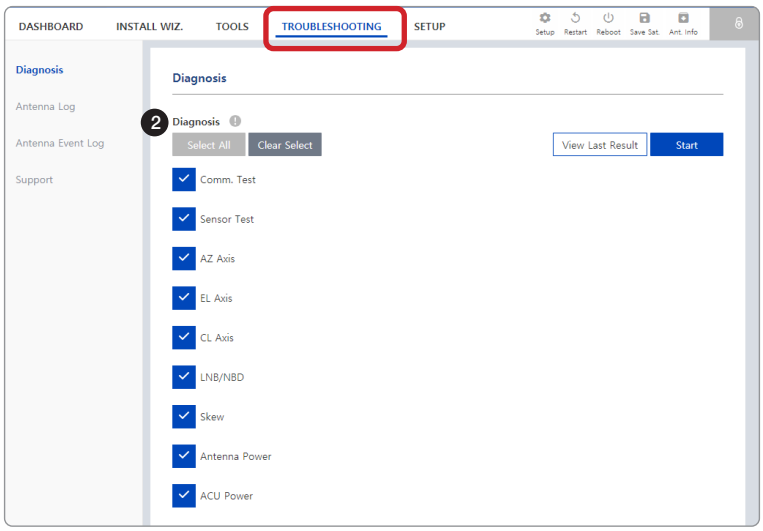
AZ & EL View

No.	Item	Description
①	Graph	This view provides information on the Signal Level, EL Graph, AZ Absolute, AZ Relative, Heading in the Multi Chart, Single Chart or AZ & EL formats.
②	Graph	Sets detailed options for the graph. • Select Graph Item: Shows the graphs of the checked item(s) in the Multi Chart, Single Chart or AZ & EL formats. - Multi Chart: Displays multiple graph Items in one graph view. - Single Chart: Displays the checked graph Item in each graph view. - AZ & EL: Displays the AZ / EL angle value in one graph view. • Range (min): Displays the data for the set time. By clicking the **Clear** button, the currently displayed graph is cleared and a new graph is displayed.

9.9 System Troubleshooting

This menu sets and displays the Diagnosis, Antenna Log, Antenna Event Log and Support function.

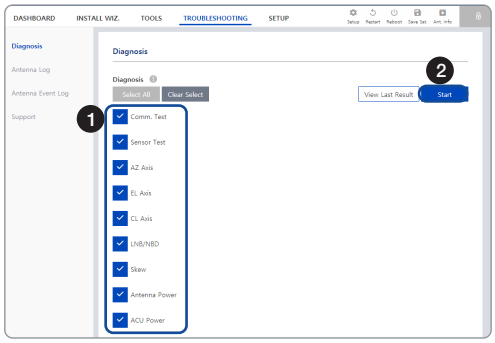
9.9.1 Diagnosis



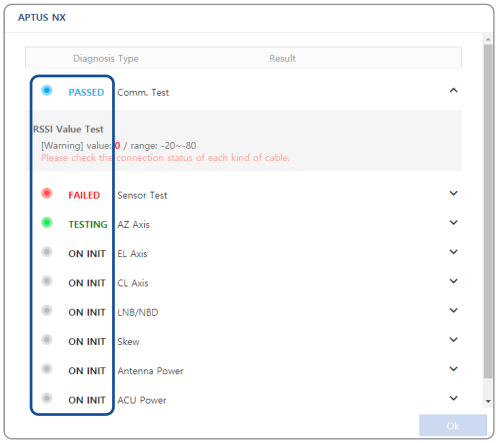
No.	Item	Description
①	Diagnosis	Executes antenna diagnosis test to check the antenna status.
②	Diagnosis	Select the checkbox for each test that you want to run on the system. You can select all the tests quickly by selecting the top checkbox. • Select All: Select to run a full diagnosis test. • Clear Select: Select to run a single diagnosis test. • View Last Result: Displays the recently saved diagnosis result. • Start: Executes the diagnosis test.

Diagnosis Procedures:

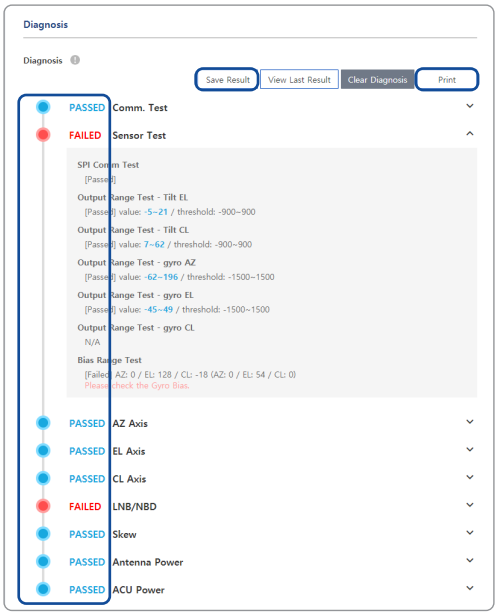
1. Select the checkbox for each test that you want to run on the system. Click the **Start** button to run the diagnostic test.



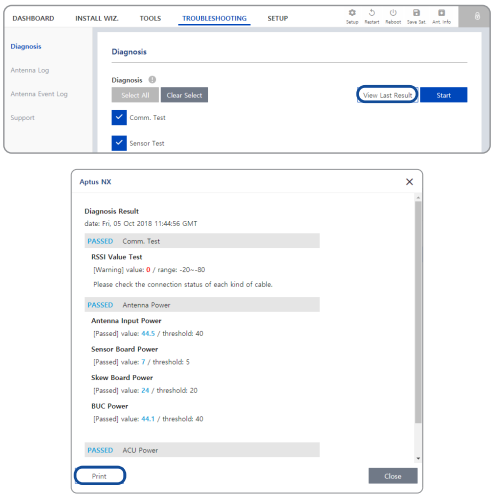
Once the diagnosis starts, the page will indicate test status. It will take a few minutes to complete the test.



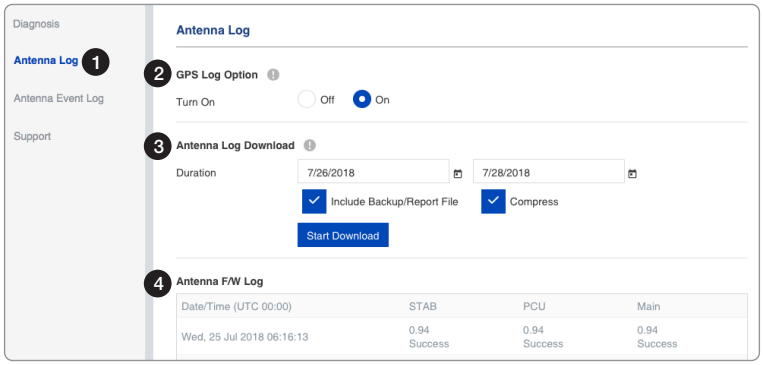
After the diagnosis is completed the system shows the diagnosis results of each item. You can save the results to the ACU by clicking the **Save Report** button and print this page by clicking the **Print** button.



2. When you want to check the recently saved diagnosis results, click the **View Last Report** button. The pop-up page of the diagnosis results, including the save date and time, will appear. You can print this page by clicking the **Print** button.

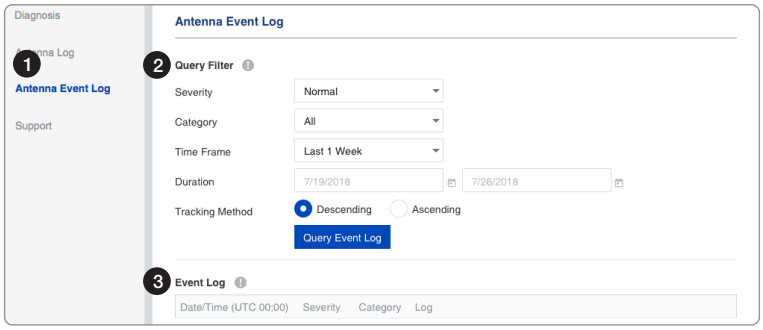


9.9.2 Antenna Log



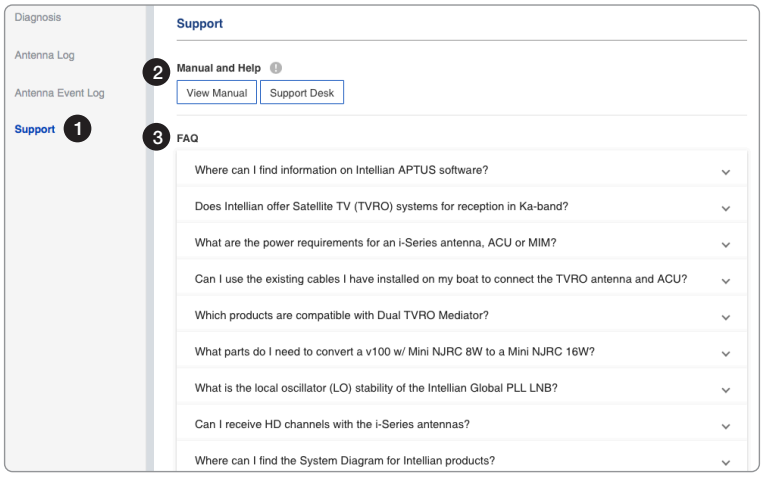
No.	Item	Description
①	Antenna Log	Displays the antenna log data.
②	GPS Log Option	Turns on/off the GPS log download option. Click the **Apply** button to apply the settings to the system.
③	Antenna Log Download	Any log data within three months can be downloaded. Select the duration on the calendar view that you want to show. Then click the **Start Download** button. **NOTE**: When selecting the box **Include Backup/Report File** before downloading, the Backup/Report File will download together. When selecting the box **Compress** before downloading, log files are downloaded in a compressed format.
④	Antenna F/W Log	Displays log information about firmware upgrade.

9.9.3 Antenna Event Log



No.	Item	Description
①	Antenna Event Log	Displays the logged events of the antenna system filtered by the urgency level, category and time frame of the events.
②	Query Filter	Sets the filter options to show the logged events. • Severity: Choose the urgency level of event to show. • Category: Choose the event category to show. • Time Frame: Choose the time frame of event log to show. • Duration: Set the duration by selecting start and end dates in the calendar. • Tracking Method: Select the sorting method (Descending / Ascending). Click the **Query Event Log** button to show the logged events under the Event Log.
③	Event Log	Displays the list of logged events filtered by the Query Filter options in the previous step.

9.9.4 Support

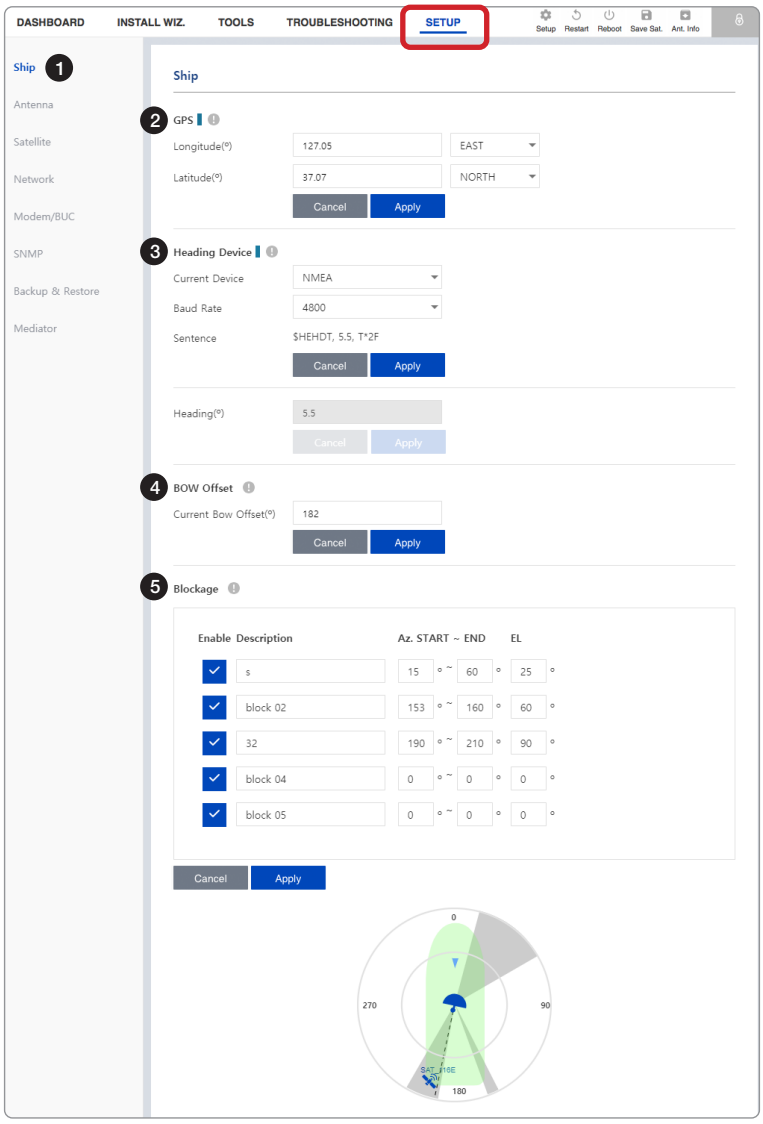


No.	Item	Description
①	Support	Supports the manual web page, support desk and FAQ list.
②	Manual and Help	Shows the manual web page and support desk information. • View Manual: Click the **View Manual** button to open the manual web page. • Support Desk: Click the **Support Desk** button to open Intellian's contact details for support.
③	FAQ	Provides answers for frequently asked questions about the product.

9.10 System Setting

This menu sets and displays the Ship, Antenna, Satellite, Network, Modem/BUC, SNMP, Backup & Restore and Mediator function.

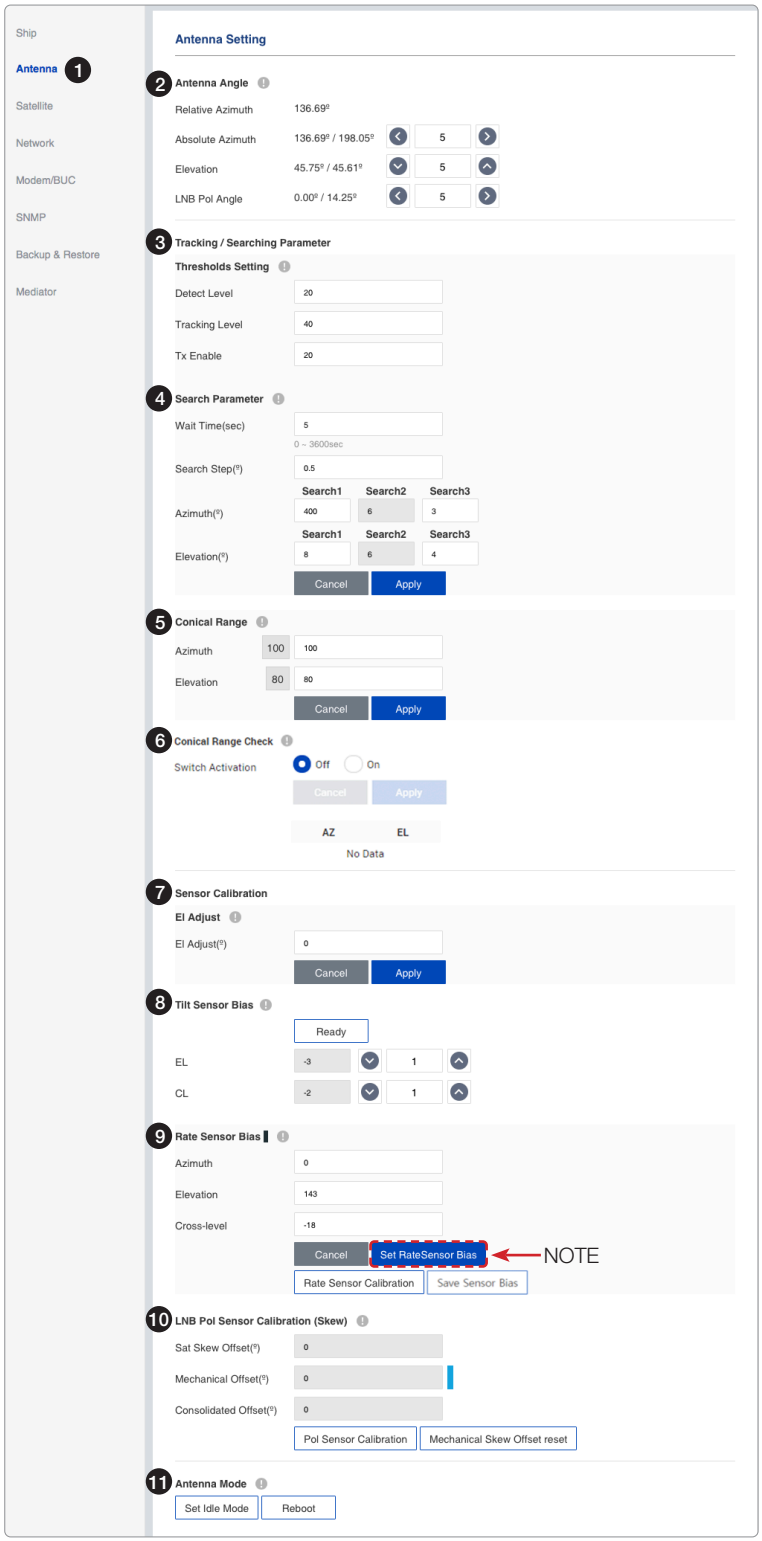
9.10.1 Ship Setting



No.	Item	Description
①	Ship	Sets the ship information and blockage zones.
②	GPS	Sets the GPS position of the vessel for searching for a satellite. Check the GPS status connected to the antenna system. The indicator to the left of the help button shows the GPS status. Make sure the GPS indicator is Blue (blinking). (Blue (blinking): the system received a correct GPS input. Black: the system has not received a GPS input. You can enter the GPS value manually to set the GPS position.) • Longitude (°): Set Longitude information (East / West). • Latitude (°): Set Latitude information (North / South). Click the **Apply** button to apply the settings to the system.

No.	Item	Description
③	Heading Device	Sets the ship's heading device. Choose the device type from the **Current Device** drop-down list. The indicator to the left of the help button shows the device connection status. (Blue: a ship's heading device is connected. Black: a ship's heading device is not connected.) • Current Device: Select the heading device (None, NMEA (0183), Static). If you select NMEA, you can also set the Baud Rate. • Baud Rate: Select the band rate (4800, 9600, 19200, 38400). It must be set when **NMEA** is selected on the **Current Device** list. • Heading(º): Enter the heading information. Click the **Apply** button to apply the settings to the system.
④	BOW Offset	For setting the bow offset, you need to select a satellite which is trackable in satellite library information. When the antenna tracks the selected satellite, bow offset will be set up automatically. • Current Bow Offset (º): Enter the Bow Offset Range (0 – 360°). Click the **Apply** button to apply the settings to the system.
⑤	Blockage	It is important to set up the blockage zones for Intellian VSAT. The VSAT system can be programmed with relative azimuth and elevation sectors to create up to five zones transmission is muted. When the antenna is within one of the zones, a transmit inhibit output from the ACU will disable/mute the modem transmission within the blockage zones. The AZ START is the relative azimuth angle where the blockage starts, and the AZ END is the relative azimuth where the blockage ends (Range: 0 ~ 360). The EL is the elevation angle where the blockage is set (Range: 0 ~ 90). The blockage is activated below the elevation angle. Click the **Apply** button to apply the settings to the system.

9.10.2 Antenna Setting



NOTE

The Set Rate Sensor Bias function must be used by experienced engineers only.

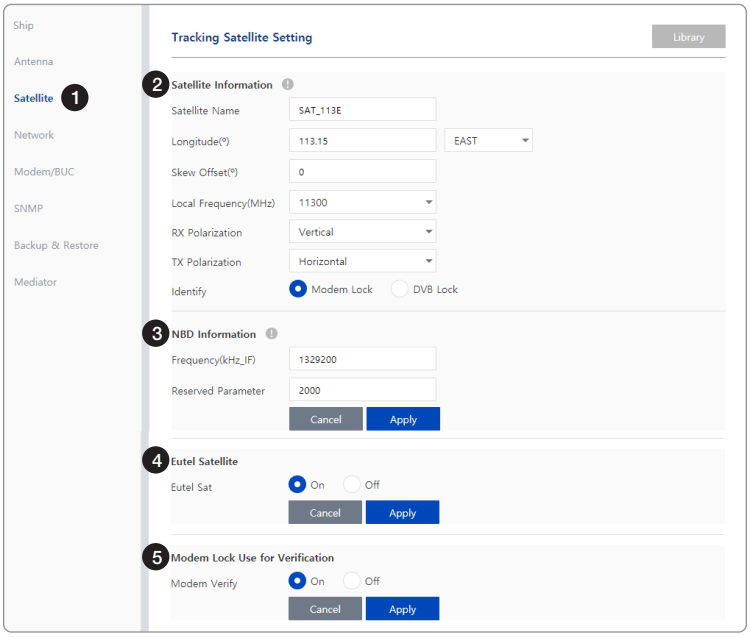
No.	Item	Description
①	Antenna Setting	Sets current antenna position and search parameters. These parameters should only be changed by an authorized service technician. Improper setting of these parameters will render your system inoperable.

No.	Item	Description
②	Antenna Angle	The system must be in **Setup Mode** to modify these settings. Sets current antenna position and LNB pol angle. You can move the antenna's azimuth and elevation position and LNB pol angle by using the arrows or inputting a value to find the desired satellite manually. • Relative Azimuth: Displays the antenna's relative azimuth angle. • Absolute Azimuth: Adjust the antenna's absolute azimuth angle. • Elevation: Adjust the elevation angle. • LNB Pol Angle: Adjust the LNB pol angle
③	Thresholds Setting	Sets current detect level threshold and tracking level threshold. • Detect Level: Enter the current detect level threshold. • Tracking Level: Enter the current tracking level threshold. • Tx Enable: Enter the Tx enable threshold. Click the **Apply** button to apply the settings to the system.
④	Search Parameter	Sets the timeout, search step and search range. • Wait Time (sec): Set the time-out for automatic initiation of a search after the signal level drops below the pre-defined threshold value. • Search Step(º): Set increment step size. • Search1/3: Set Search 1 and 3 search range. Search is conducted in a two-axis pattern consisting of alternate movements in azimuth and elevation to form an expanding square. • Search2: It is reserved for the future use. Click the **Apply** button to apply the settings to the system.
⑤	Conical Range	The relative force of the motors controlling azimuth and elevation. Sets the conical range while the antenna is in tracking mode. Click the **Apply** button to apply the settings to the system.
⑥	Conical Range Check	The system must be in **Setup Mode** to modify these settings. Monitors the Azimuth and the elevation values when the conical range is modified. • Switch Activation: Choose whether to use the switch activation function (On / Off). Click the **Apply** button to apply the settings to the system.
⑦	Sensor Calibration	Enter **Setup Mode** to modify settings. Adjusts the elevation to offset the angle difference between the mechanical elevation angle and actual elevation angle. Click the **Apply** button to apply the settings to the system.

No.	Item	Description
⑧	Tilt Sensor Bias	**NOTE:** The tilt values of the elevation and cross-level axes were calibrated to the optimal condition at the factory prior to shipment. However, when the antenna MCU unit or fixed sensor unit is replaced, the elevation and the cross-level axes must be checked by adjusting tilt and rate sensor value. Refer to the replacement manual for detailed procedures. The separate device (e.g. level indicator) for manual adjustment is not provided by Intellian. Enter **Setup Mode** to modify settings. Maintain the elevation and the cross-level axes to keep the pedestal parallel to the horizon. • Ready: Click the **Ready** button to bring the elevation and cross-level to 0. • EL/CL: Select **EL/CL** and click the Up and Down arrow keys to adjust the elevation and cross-level. Click the **Restart** button on the top menu to restart the antenna system.
⑨	Rate Sensor Bias	**NOTE:** The rate values of the azimuth, elevation, and cross-level axes were calibrated to the optimal condition at the factory prior to shipment. If additional rate adjustment is required, make sure that the antenna is placed on a rigid and flat platform. During the calibration process, the antenna must avoid any motion as it can affect the antenna's performance. Enter **Setup Mode** to modify settings manually. Calibrates DC voltage output from the three rate sensors used to sense antenna motion in azimuth, elevation and cross-level axes. These are used to sense antenna motion that corresponds to the ship's motion (roll, pitch, and yaw) for stabilizing the pedestal. The DC voltage output from each of the rate sensors may vary by an amount which is directly proportional to the direction and rate of motion induced on it. • Rate Sensor Calibration: click the **Rate Sensor Calibration** button to calibrate the rate sensor automatically. The indicator to the left of the help button shows the rate sensor calibration status. (Black: The calibration is ready to start. Blue: the calibration is completed. Red: The calibration failed. Green: The calibration is in process.) • Save Sensor Bias: click the **Save Sensor Bias** button to save the calibrated value of the rate sensor to the system.

No.	Item	Description
⑩	LNB Pol Sensor Calibration (Skew)	Calibrates the LNB pol angle when the control board, the skew motor or belt is replaced. • Sat Skew Offset: Displays the skew offset value. • Mechanical Offset: Displays the skew offset value. The indicator right of the value box shows the skew offset status. - Blue: Mechanical skew offset value is less than ±10 degrees. - Red: Mechanical skew offset value is greater than ±10 degrees. • Consolidated Offset: Displays the consolidated offset value. • Pol Sensor Calibration: Calibrates the skew motor and checks the skew range. • Mechanical Skew Offset Reset: To reset the mechanical skew offset value to 0, click on the **Mechanical Skew Offset Reset** button. The mechanical skew offset is pre-set with a factory default value (0, 1 or 2) depending on the assembly condition. You may need to reset the mechanical skew offset when the satellite skew offset is unknown (consolidated skew offset = satellite skew offset + mechanical skew offset). Mechanical skew offset is set automatically by moving the Pol Angle left or right in the search or tracking mode. • **NOTE**: Each satellite has its own skew offset. Intellian recommends you to contact your service provider or satellite operator to get the satellite skew offset value. To set the satellite offset value, go to **SETUP** menu → **Satellite** → **Satellite Information** → **Skew Offset**.
⑪	Antenna Mode	Sets the motor to idle mode to check the antenna's balance. • Set Idle Mode: The system must be in **Setup Mode** to modify this setting. Releases the elevation and cross-level motor. • Reboot: Reboots the system.

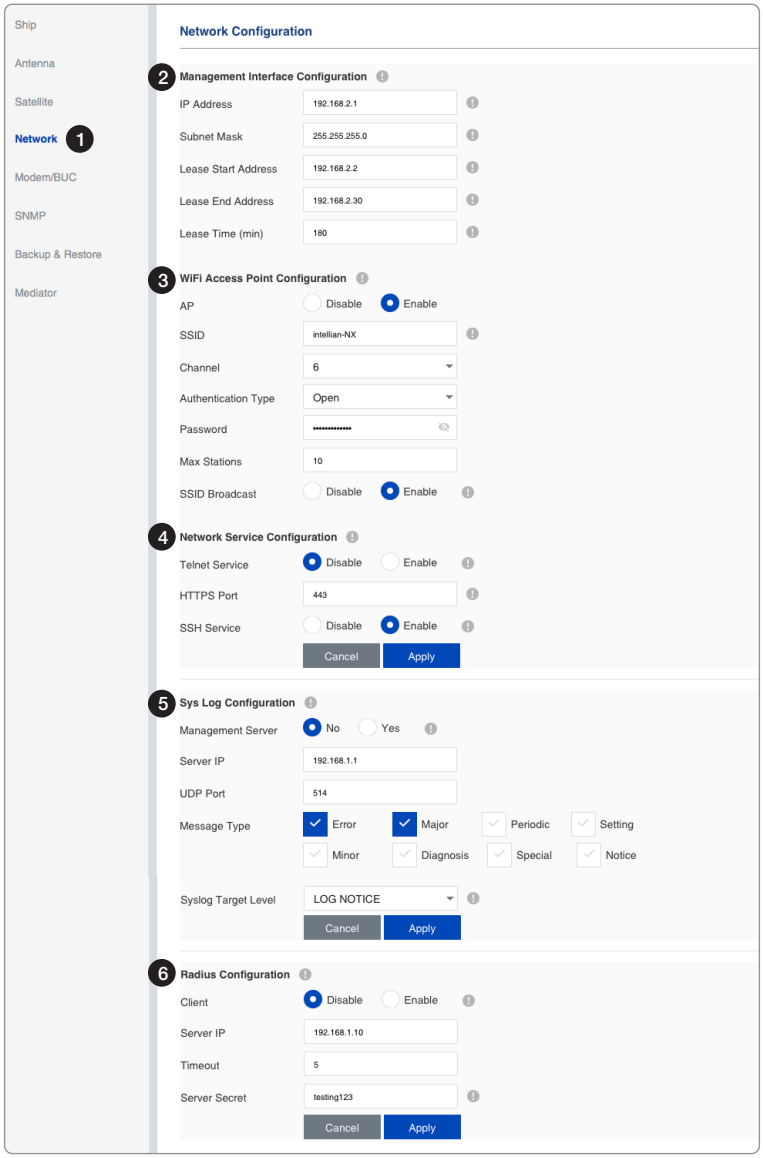
9.10.3 Tracking Satellite Setting



No.	Item	Description
①	Tracking Satellite Setting	Sets the current tracking satellite settings.
②	Satellite Information	Sets the current tracking satellite settings. • Satellite Name: Enter the satellite name. • Longitude (°): Enter the satellite orbit position. • Skew Offset (°): Enter the skew offset. **NOTE**: Each satellite has its own skew offset. You may contact your service provider or satellite operator to get the satellite skew offset value. • Local Frequency (MHz): Select the local frequency. • Rx Polarization: Select the current Rx polarization. • Tx Polarization: Select the current Tx polarization. • Identify: Select the lock setting type (Modem Lock or DVB Lock) for satellite tracking. Click the **Apply** button to apply the settings to the system.
③	NBD Information	Sets NBD mode's tracking information. • Frequency (kHz_IF): Set the tracking frequency. • Reserved Parameter(kHz): Set the reserved parameter. Click the **Apply** button to apply the settings to the system.
④	Eutel Satellite	Select **ON** when the antenna is tracking the Eutelsat satellite. With this option enabled, a defined skew angle for each Eutelsat satellite is automatically applied without allowing a manual modification to the skew offset value. Click the **Apply** button to apply the settings to the system.
⑤	Modem Lock Use for Verification	Verifies modem lock status (modem lock function: active/inactive). • Modem Verify: Turn on or off the modem lock function (On / Off) Click the **Apply** button to apply the settings to the system.

9.10.4 Network Configuration

This function is available after performing the **"9.8.3 iARM Save & Reboot" on page 92**.

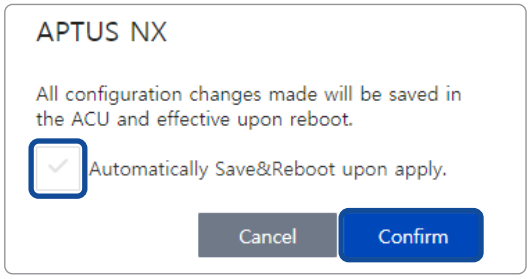


No.	Item	Description
①	Network Configuration	Sets the ACU's Internal IP address and ports.
②	Management Interface Configuration	Sets the Management Port's network configuration. The Management Port is located on the ACU front panel. • IP Address: Set the network IP address (Factory default: 192.168.2.1). • Subnet Mask: Set the subnet mask (Factory default: 255.255.255.0). • Lease Start Address: Set the lease IP address start range. DHCP will only assign IP addresses within the start and end range. • Lease End Address: Set the lease IP address end range. • Lease Time: Set the lease IP address update time. This is the amount of time in seconds (default 604800 seconds or 7 days) that an IP address is reserved for a network device. Click the **Apply** button to apply the settings to the system.

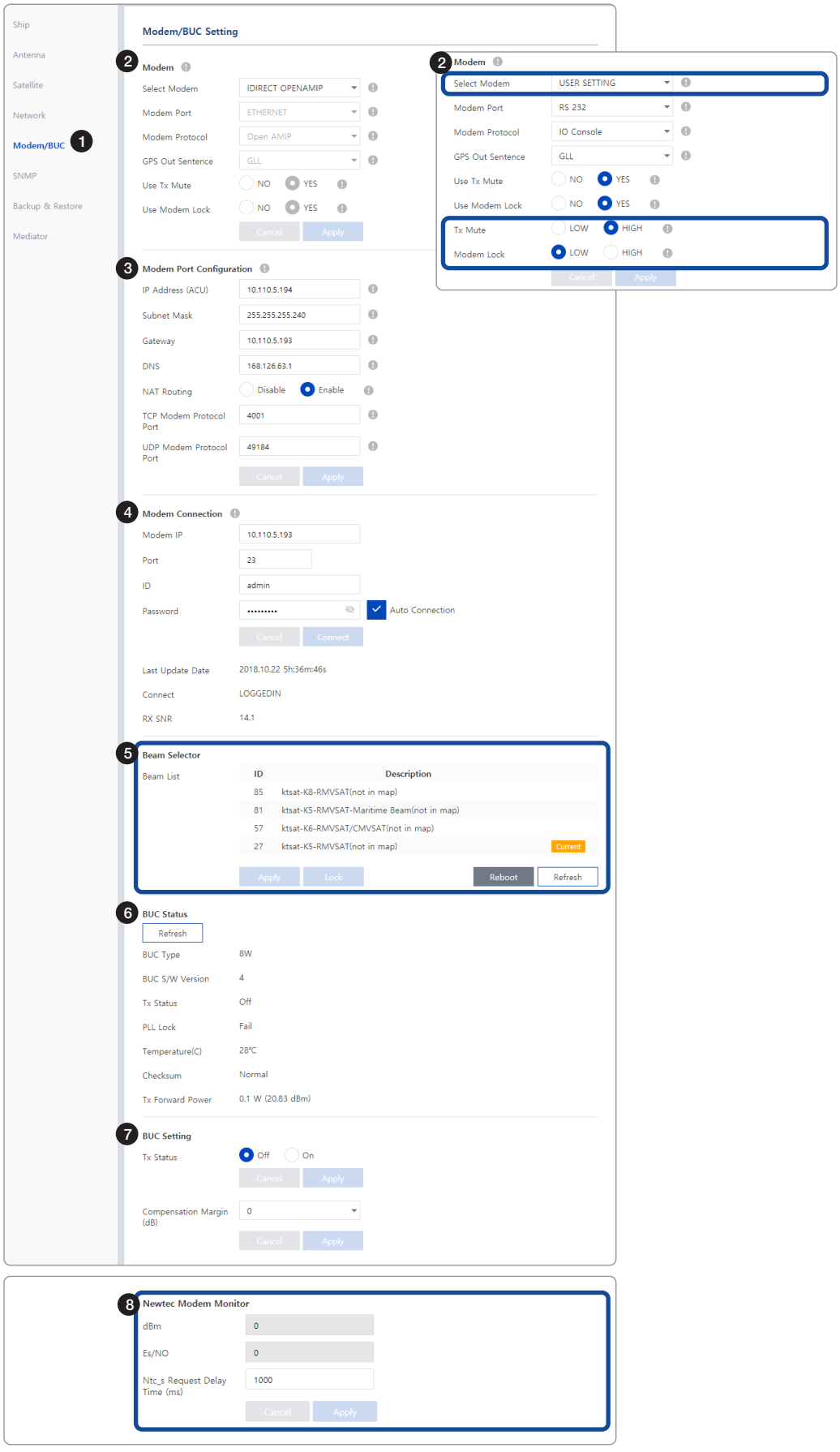
No.	Item	Description
③	Wi-Fi Access Point Configuration	Set up for the Wi-Fi access point function of ACU. • AP: Enable or disable the Access Point (AP) function. • SSID: The SSID is the name that allows devices to identify and connect to the wireless network. The SSID is case-sensitive and must not exceed 32 alphanumeric characters, and it can be any keyboard character. The SSID is the same for all devices that connect to your wireless network. • Channel: Select an appropriate channel from the list provided to correspond with your network settings. All devices that connect to your wireless network will use the same channel automatically. Try to avoid conflicts with other wireless networks by choosing a channel where the upper and lower three channels are not in use. • Authentication Type: The module supports an authentication mode that the 802.11 device uses when it authenticates and associates with an access point or IBSS cell. • Password: Set the password for Wi-Fi access point. • Max Stations: Enter the maximum number of stations. • SSID Broadcast: Enable or disable the SSID broadcast function. Click the **Apply** button to apply the settings to the system.
④	Network Service Configuration	Sets the network service configuration • Telnet Service: Sets the telnet service (Disable / Enable). • HTTPS Port: Sets the HTTPS port number. • SSH Service: Sets the SSH service status (Disable / Enable). Click the **Apply** button to apply the settings to the system.
⑤	Sys Log Configuration	Sets the system log configuration. Antenna sends log messages according to the emergency level. Enabling this function sends the message to your management server. • Management Server: Sets the management server status (No / Yes). • Server IP: Sets the management server IP address. • UDP Port: Sets the management port. • Message Type: Selects message type (Intellian message level) to send to the management server (Lower number indicates higher emergency). • Syslog Target Level: If you select this target level, the management server receives a log message equal to or less than this level. Click the **Apply** button to apply the settings to the system.
⑥	Radius Configuration	***This menu is used when the network administrator needs to authorize user connections using Radius server.*** • Client: Sets the Radius authentication (Disable / Enable). • Server IP: Sets the Radius server IP Address. • Timeout: Sets the Timeout value in seconds for the authentication process. • Server Secret: Sets the Pass-Phase. This should be matched between server and ACU. Click the **Apply** button to apply the settings to the system.

NOTE

When clicking the **Apply** button after editing the system settings, this pop-up message will appear. If you want to automatically save and reboot the system, select the checkbox and click the **Confirm** button.



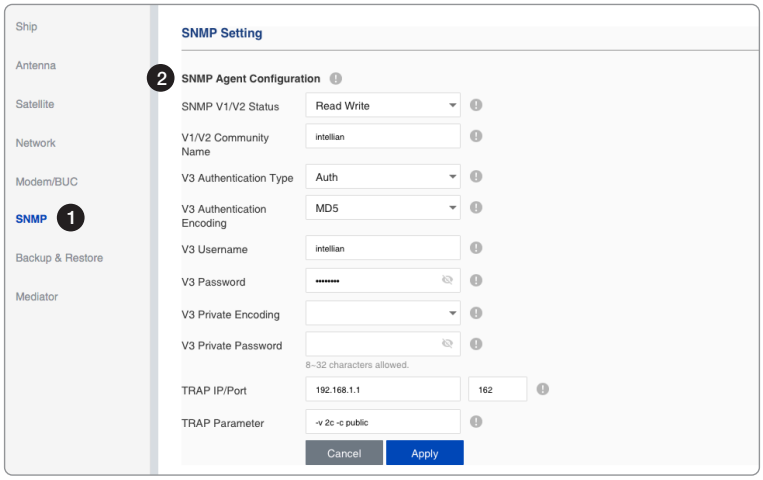
9.10.5 Modem/BUC Setting



No.	Item	Description
①	Modem/BUC Setting	Sets the modem and BUC interface.
②	Modem	Sets the interface between the ACU and the satellite modem. • Select Modem: Select your modem type from the **Select Modem** drop-down list for loading a pre-configuration for the type of modem used. The settings related to the modem interface will be set automatically once the modem type is selected. When you select **USER SETTING** the other settings can be changed independently. • Modem Port: Select a proper data communication port of the ACU for the satellite modem interface. • Modem Protocol: Select a proper communication protocol of the ACU for the modem interface. • GPS Out Sentence: Select the GPS out sentence type. • Use Tx Mute: Select whether you use the **Tx Mute** function for the modem or not. • Use Modem Lock: Select whether you use **Modem Lock** function for the modem or not. • Tx Mute: This function can be edited when **User Setting** option is selected in the **Select Modem** menu. It selects the Tx Mute option. The Tx Mute is a transmit inhibit output from the ACU to disable/mute the modem transmit through a 5 V (HIGH) or 0 V (LOW) current whenever the antenna is blocked, searching, or pointed 0.5 degrees off from peak satellite position. • Modem Lock: This function can be edited when **User Setting** option is selected in the **Select Modem** menu. It selects the Modem Lock option. The Modem Lock provides a logic input through a 5 V (HIGH) or 0 V (LOW) current to the ACU to identify when the system is on the correct satellite. Click the **Apply** button to apply the settings to the system.
③	Modem Port Configuration	This function is available after performing the **"9.8.3 iARM Save & Reboot" on page 92**. Sets the ACU's internal IP address, routing, and ports. • IP Address: Enter the network IP address. **CAUTION**: when using Dual Antenna System, the "IP Address" of the "Modem Port Configuration" for the Primary ACU and the Secondary ACU must be specified differently. If you specified the same IP address, the system will not connect to a modem and can not use a dual antenna system function. • Subnet Mask: Enter the subnet mask. • Gateway: Enter the gateway. • DNS: Enter the current default DNS address. • NAT Routing: Select the NAT routing (Enable / Disable). • TCP Modem Protocol Port: Enter the TCP port number for modem protocols using TCP as transport. • UDP Modem Protocol Port: Enter the UDP port number for modem protocols using UDP as transport. Click the **Apply** button to apply the settings to the system.

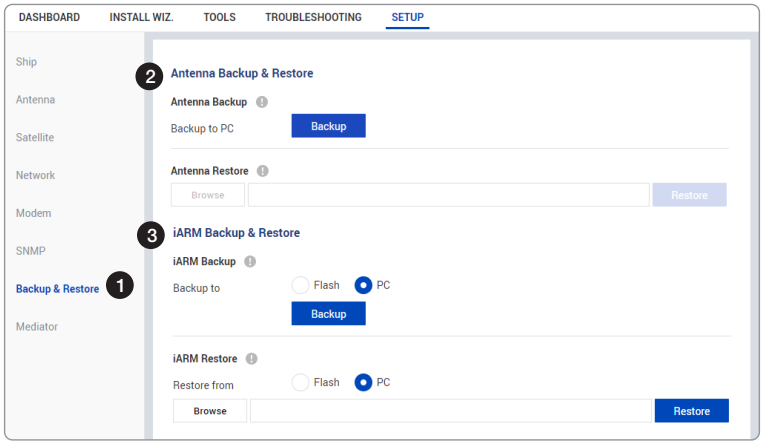
No.	Item	Description
④	Modem Connection	Enter the connection information of the modem. • Modem IP: Enter the modem IP address. • Port: Enter the connection port. • ID: Enter the connection ID. • Password: Enter the connection password. • Auto Connect: By enabling the auto connect, the connection information is saved and the modem is connected automatically when the system reboots. • Last Update Date: Displays the last update date and time. • Connect: Displays last updated data and time of the modem data. • Rx SNR: Displays the Rx SNR data.
⑤	Beam Selector	***This menu can be edited when* IDIRECT Open AMIP Modem *option is selected in the* Select Modem *menu.*** Selects the target satellite that you want to track. • Beam List: Choose the target satellite in the list. • Apply: Click the **Apply** button to apply the selected beam to the system, it will switch to the beam desired. • Lock: Within condition given for test or commissioning, if the user wishes to stay on a selected beam, the user can lock the beam by clicking the **Lock** button. This will lead modem stays with the user-selected beam. • Reboot: If you do not want to lock the beam, click the **Reboot** button. • Refresh: Click the **Refresh** button to load the latest satellite list.
⑥	BUC Status	***This function is activated depending on the BUC type.*** Displays current BUC status information (BUC Type, BUC S/W Version, Tx Status, PLL Lock, Temperature, Checksum and Tx Power Level). • To Refresh BUC information: Click the **To Refresh BUC information** button to update the BUC status information.
⑦	BUC Setting	***This function is activated depending on the BUC type.*** Sets the BUC setting options. • Tx Status: Select the transmission status of BUC signal (ON or OFF). • Compensation Margin (dB): Set the compensation margin. Click the **Apply** button to apply the settings to the system.
⑧	Newtec Modem Monitor	***This menu can be edited when* NEWTEC AMIP *option is selected in the* Select Modem *menu.*** Sets the Newtec Modem options. • dBm: Displays the signal level from the Newtec Modem. • Es/NO: Displays the Es/NO value from the Newtec Modem. • Ntc_s Request Delay Time (ms): Set the delay time of the system for receiving the signal level (dBm) and Es/NO value from the Newtec Modem. Click the **Apply** button to apply the settings to the system. Then perform **"9.8.3 iARM Save & Reboot" on page 92**.

9.10.6 SNMP Setting



No.	Item	Description
①	SNMP Setting	Sets SNMP configuration.
②	SNMP Agent Configuration	Sets the SNMP configuration. • SNMP V1/V2 Status: Choose the SNMP mode. • V1/V2 Community Name: Enter the SNMP V2 community name. • V3 Authentication Type: Enter the SNMP V3 authentication mode. • V3 Authentication Encoding: Choose the SNMP V3 authentication encoding. • V3 Username: Enter the V3 username of the SNMP Agent. • V3 Password: Set the V3 password of the SNMP agent. The password must be at least eight character long. • V3 Private Encoding: Choose the SNMP V3 private encoding. • V3 Private Password: Set the V3 private password. The password is must be at least eight character long. • TRAP IP/Port: Enter the TRAP IP/Port. • TRAP Parameter: Enter the SNMP trap specific parameter. Click the **Apply** button to apply the settings to the system. Then perform the **"9.8.3 iARM Save & Reboot" on page 92**.

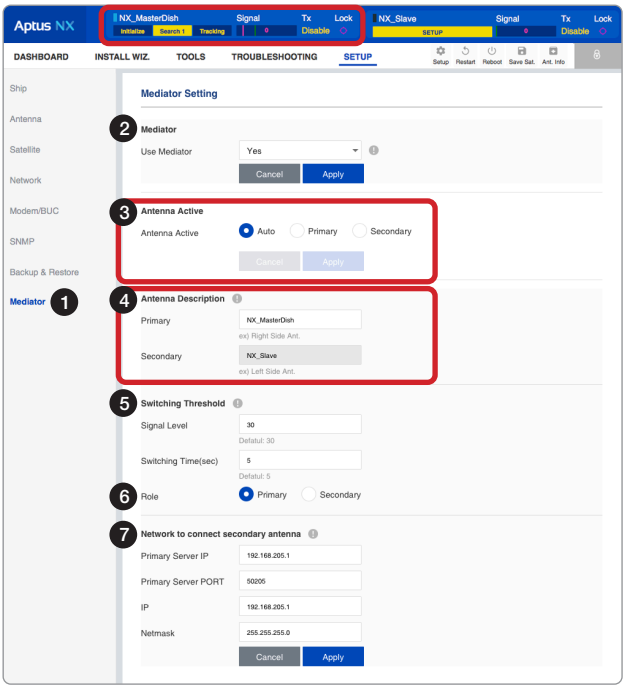
9.10.7 Backup & Restore Setting



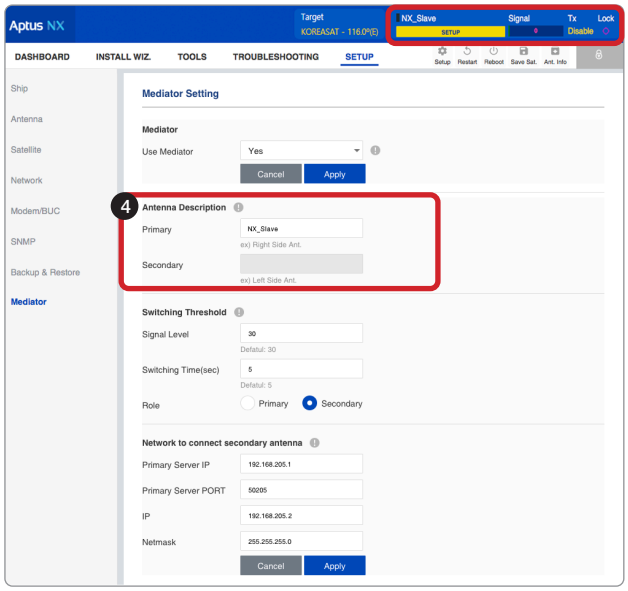
No.	Item	Description
①	Backup & Restore Setting	Backs up & Restores the antenna setting files and the iARM files.
②	Antenna Backup & Restore	• Antenna Backup: Back up antenna settings and parameters to PC by clicking on the **Backup** button. • Antenna Restore: Restore the antenna setting by uploading the saved backup file from PC. **Browse** the backup file, then click the **Restore** button to restore it.
③	iARM Backup & Restore	• iARM Backup: Back up iARM setting to internal Flash drive in ACU or PC by clicking the **Backup** button. • iARM Restore: Restore the iARM settings by uploading the saved backup file from internal Flash drive in ACU or PC. **Browse** the backup file, then click the **Restore** button to restore it.

9.10.8 Mediator Setting (Optional: For Dual Antenna System)

This function is available when using a Dual Antenna System.



Primary Antenna's AptusNX View



Secondary Antenna's AptusNX View

No.	Item	Description
①	Mediator Setting	Intellian's new ACU has an embedded Dual Antenna Mediator function, which is used to instantly switch between two Intellian VSAT antenna system. When one antenna is blocked by obstacles or has suddenly lost service, the other antenna will immediately provide fail-safe operation to maintain the highest levels of system performance and reliability.
②	Mediator	Enable or disable the dual antenna mediator function. • Yes: Enables the mediator function to use the Dual Antenna System. The mediator options are shown for detailed function settings. • No: Disables the mediator function. Click the **Apply** button to apply the settings to the system. Then perform the **"9.8.3 iARM Save & Reboot" on page 92**.
③	Antenna Active	This function is available in the Primary Antenna's AptusNX when both Primary Role's ACU and Secondary Role's ACU are connected to the system. Sets the method for selecting the active antenna. The active antenna (either primary or secondary antenna) is communicating (Tx/Rx) with a satellite. • Auto: This method is recommended. Automatically switch-over to the primary or secondary antenna which has no blockages and no errors. • Primary: Manually switch-over to the primary antenna which is connected to the modem and the gyrocompass. • Secondary: Manually switch-over to the secondary antenna. Click the **Apply** button to apply the settings to the system.

No.	Item	Description
④	Antenna Description	This menu is differently shown in the Primary Antenna's AptusNX and the Secondary Antenna's AptusNX. To clearly distinguish the primary antenna and the secondary antenna, enter a description to each antenna. • Primary: Enter the description for the primary antenna in AptusNX (Editable). This menu is not shown for the secondary antenna in AptusNX. • Secondary: Enter the description for the secondary antenna in AptusNX (Editable). This menu is displayed as Read-only for the primary antenna in AptusNX. Click the **Apply** button to apply the settings to the system. Then perform the **"9.8.3 iARM Save & Reboot" on page 92**.
⑤	Switching Threshold	When two antennas are in Tracking mode and have no blockage, the allowable value will apply for the automatic switching. • Signal Level: If the signal level is less than the set value, the active antenna is automatically switched (Default: 30). • Switching Time (sec): If the signal value difference between the active antenna and inactive antenna is more than the set value which is set in the **Signal Level** menu and the difference is maintained for a set time, the active antenna is automatically switched. Set the switching time value (Default: 5). Click the **Apply** button to apply the settings to the system. Then perform the **"9.8.3 iARM Save & Reboot" on page 92**.
⑥	Role	Assigns the antenna's role as the primary or secondary antenna. • Primary: When running the primary ACU, which is connected to the modem and the gyrocompass, select the primary role. The primary ACU is assigned and operated as the primary antenna, which will communicate with the target satellite. • Secondary: When running the secondary ACU, select the secondary role. The secondary ACU is assigned and operated as the secondary antenna, which will be on standby and ready to assume primary antenna role to provide better service in the event of tracking failure or low signal level status. Click the **Apply** button to apply the settings to the system. Then perform the **"9.8.3 iARM Save & Reboot" on page 92**.
⑦	Network to connect secondary antenna	Sets the primary antenna's network information to transmit to the secondary antenna. • Primary Server IP: Enter the server IP address (Default: 192.168.205.1). • Primary Server PORT: Set a server port number for the primary antenna and the secondary antenna, which must be the same number (Default: 50205). • IP: When the antenna role is primary, enter the same IP address with the "Primary Server IP". When the antenna role is secondary, enter a different IP address from the "Primary Server IP"; however, it must be assigned to the same network class as the primary (Default: 192.168.205.1). • Netmask: The primary and secondary netmasks must be the same (Default: 255.255.255.0). Click the **Apply** button to apply the settings to the system. Then perform the **"9.8.3 iARM Save & Reboot" on page 92**.

CAUTION

When using the Dual Antenna System, the IP address under the Modem Port Configuration for the Primary ACU and the Secondary ACU must be assigned differently.

Chapter 10. Specification

10.1 Technical Specification

Antenna System		
Antenna Radome Height		1724 mm (67.87")
Antenna Radome Diameter		Ø1681 mm (66.18")
Antenna Reflector Diameter		Ø1250 mm (49.21")
Antenna Unit Weight (With Radome)		150 kg (330.69 lbs)
Platform		3-axis: Azimuth, Elevation, Cross-level
Positioning		3-axis Velocity Mode Servo Control: Azimuth, Elevation, Cross-Level
Azimuth Range		Unlimited
Elevation Range		-20° to +115°
Cross-level Range		Up to ±37°
Stabilization Accuracy		0.2° peak mispointing @ max ship motion condition
Motor Brake System		Dynamic braking
Ship's Motion	Roll	±25° at 6 second
	Pitch	±15° at 6 second
	Yaw	±8° at 6 second
	Turning rate	Up to 12°/sec & 5°/sec²
Rx	Frequency	10.7 GHz ~ 12.75 GHz Ku-band
	Gain	42 dBi @ 11.7 GHz (without radome)
Tx	Frequency	13.75 GHz ~ 14.5 GHz Ku-band
	Gain	43.5 dBi @ 14.25 GHz (without radome)
Above Deck IFL Termination		1 x 50 Ω N-type female connector Tx, Rx: 10 MHz / 50 MHz, 400 MHz, 433 MHz L-band (950 MHz ~ 2150 MHz) DC power to BUC & pedestal (and LNB)
G/T over Rx Range at elevation angle Min. 30 deg.		Min. 21.0 dB/K @ 12.75 GHz (with radome)
Polarization		Linear (X-pol, Co-pol)
BUC		NJRC 8 W (standard), 16 W, 25 W (optional)
LNB		Intellian PLL LNB
Dual Antenna System		Mediator function is embedded in ACU
ACU to ADU Cable (Antenna Cable)		Single 50 Ω coax RF cable connected from ACU to ADU for Rx, Tx, FSK, Reference and Power
Input power		48 V DC (Max. 500 W) through a single RF cable
Antenna Control Unit (ACU)		
ACU Size		431 mm x 350 mm x 44.3 mm
ACU Weight		5.5 Kg
Display		256 x 64 Graphic OLED
Key		Two Push Keys
LED Indicator		Three LEDs for Power, Tracking and Error

USB Port	2 ea (front panel), 1 ea (back panel, for Wi-Fi dongle)
Ship's Gyrocompass Interface	NMEA 2000, NMEA 0183 (GYRO)
GPS	NMEA Out
Serial Interface	RS-232C (57600 bps 8, N, 1)
BUC Interface	RS422/Keyline Port (LK0080_ D SUB to RJ45 Cable)
Ethernet Port	RJ45, TCP/ IP Connection
RF Interface	Primary/Modem Rx/Tx In/Out: F-Type x 2 ea Secondary BDE Rx/Tx In/Out: F-Type x 2 ea Antenna Rx/Tx/DC Power In/Out: N-Type x 1 ea
Mediator Interface	Embedded in ACU, Primary, Secondary Control on ***AptusNX***
Input Power	100 ~ 240 V AC, 50/60 Hz, 3.3 A

10.2 Environmental Specification

Test	**Intellian Standard**	
Temperature (ADE)	Operational	-25 °C to +55 °C, Power On (IEC-60945)
	Survival	-40 °C to +80 °C, Powered On and a non-functional state (IEC-60945)
	Storage	-40 °C to +85 °C, Power Off (IEC-60945)
Temperature (BDE)	Operational	-15 °C to +55 °C (IEC-60945)
	Survival	-25 °C to +70 °C (IEC-60945)
	Storage	-40 °C to +85 °C (IEC-60945)
Wind	56 m/sec (125 mph)	
Humidity	IEC-60068-2-30 Upper Test Temp.: +40 °C (-3), Humidity 98 % Lower Test Temp.: +15 °C (+3), Humidity 71 % ~ 78 %	
Vibration	Operational	IEC-60945
	Survival	IEC-60721-3-6 Class 6M3 DNV Standard No. 2.4, Class C
Shock	Operational	IEC-60068-2-27 Method Ea 20 g, 7 ms
	Survival (Transient)	IEC-60721-3-6 Class 6M3 type II 30 g, 6 ms
	Survival (Bump)	IEC-60068-2-29 Method Eb 25 g, 6 ms
Salt Mist	Saline Solution: 5 ±1 % NaCl Storage Period: 7 Days (IEC-60945)	
Waterproofing	IPX6 (IEC-60529)	
Solar	IEC 60945-Annex B. Operational +32 °C air temperature with the addition of 670 Watt/m² solar radiation	

Chapter 11. Warranty

Warranty Policy

Intellian systems are warranted against defects in parts and workmanship. These warranties cover THREE (3) YEAR of parts and TWO (2) YEAR of factory repair labor to return the system to its original operational specification.

Warranty periods commence from the date of shipment from Intellian facility or date of installation, whichever is sooner. The warranty provides a maximum of 6 months additional coverage if you submit an authorized form describing the installation within 6 months of the shipment date.

Intellian Technologies warranty does not apply to a product that has been damaged and subjected to accident, abuse, misuse, non-authorized modification, incorrect and/or non-authorized service, or to a product on which the serial number has been altered, mutilated or removed. Intellian Technologies, will (at its sole discretion) repair or replace during the warranty period any product which is proven to be defective in materials or workmanship, in accordance with the relevant product warranty policy. All products returned to Intellian Technologies during the warranty period must be accompanied by a Service Case reference number issued by the dealer/distributor from Intellian Technologies, and (where applicable) a copy of the purchase receipt as a proof of purchase date, prior to shipment. Alternatively, you may bring the product to an authorized Intellian Technologies dealer/distributor for repair.

Chapter 12. Appendix

12.1 Appendix A. Tightening Torque Specification

This table shows the recommended values of tightening torques.

Bolt Size	Tightening Torque (N-m)
M2	0.5
M2.5	1
M3	1.5
M4	3
M5	6
M6	12
M8	27
M10	50
M12	85
M14	130
M16	200

12.2 Appendix B. Starting Dual Antenna System (Optional)

Intellian ACU has the embedded Dual Antenna Mediator function, which is used to instantly switch between two Intellian VSAT antenna systems. When one antenna is blocked by obstacles or has suddenly lost service, another antenna will immediately provide a fail-safe operation to maintain the highest levels of system performance and reliability. This ensures always-on broadband service by reducing the out of service time.

12.2.1 Configuration of Dual Antenna System

To use the Dual Antenna System, make sure the antenna system components are properly installed. Refer to **"6.4.2 Dual Antenna System Configuration (Optional)" on page 38** for more details.

12.2.2 Setting Up Dual Antenna System

To establish Dual Antenna System communication between the primary and secondary antennas, follow the steps below.

Connecting Ethernet Cable

Connect an Ethernet cable from the Management LAN port on the front of the Primary/Secondary ACU to the LAN port of PC. The connection network is established.

Process to Set Up Dual Antenna System

The following flow chart shows the process of establishing the Dual Antenna System.

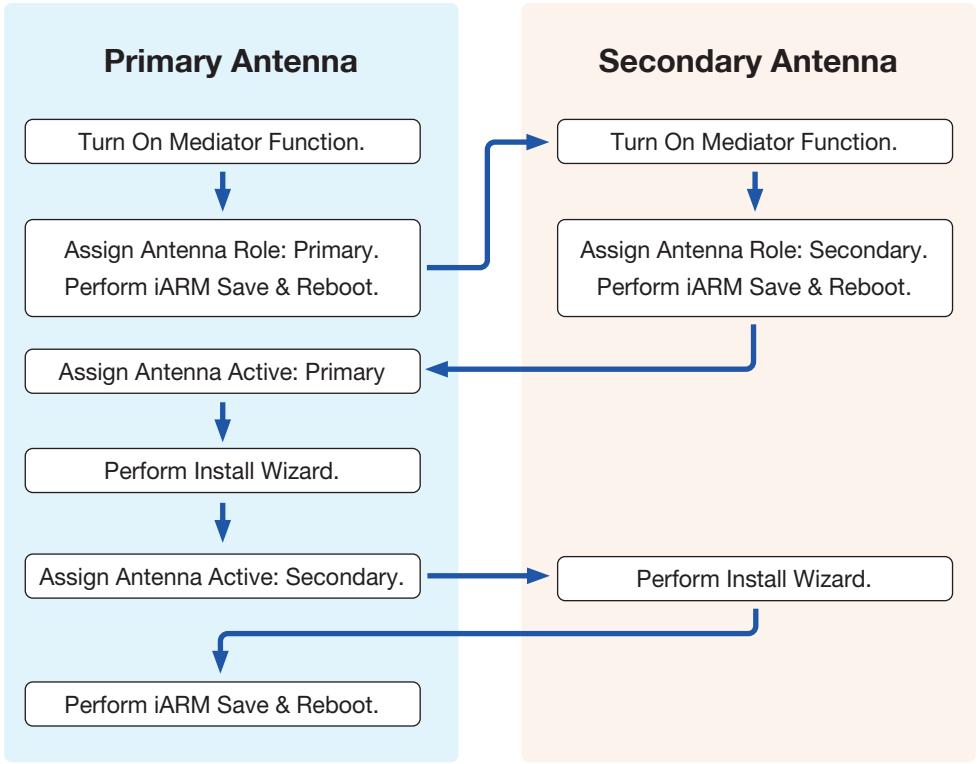
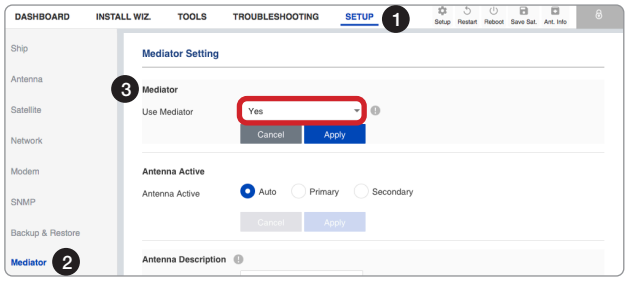


Figure 35: Flow Chart of Establishing Dual Antenna System

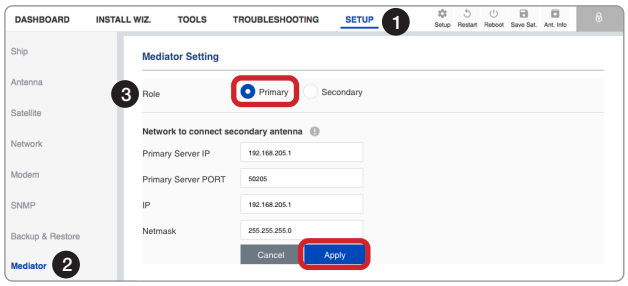
Assigning Antenna Role

Access the AptusNX (**IP Address: 192.168.2.1**) to manage and control the Dual Antenna System. Go to **SETUP > Mediator > Mediator Setting**. Select the **Yes** for the **Use Mediator** option.



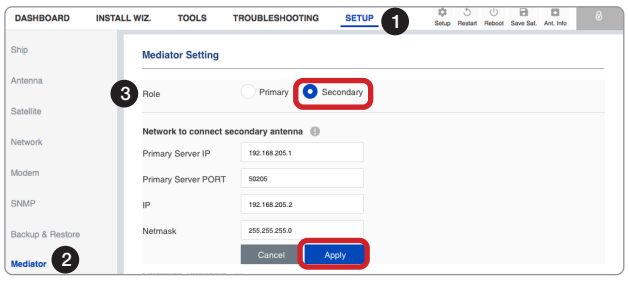
1. **Assigning Primary Antenna Role**

When connecting the primary ACU, which is connected to the modem and the gyrocompass, select **"Primary"** for the **Role** option. The primary ACU is assigned and operated as the primary antenna, which communicates with the target satellite. Click the **Apply** button to apply the settings to the system. Then perform **"9.8.3 iARM Save & Reboot" on page 92**.



2. **Assigning Secondary Antenna Role**

When connecting the secondary ACU, select **"Secondary"** for the **Role** option. The secondary ACU is assigned and operated as the secondary antenna, which will be on standby and ready to assume primary antenna role to provide better service in the event of tracking failure or low signal level status. Click the **Apply** button to apply the settings to the system. Then perform **"9.8.3 iARM Save & Reboot" on page 92**.



12.2.3 Performing Install Wizard

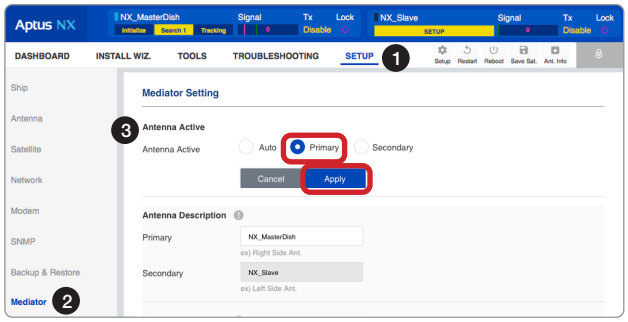
To control and manage both of the primary and secondary antenna systems, access the AptusNX with the Primary Antenna. Before starting the Dual Antenna System, perform the Install Wizard of the primary and secondary antenna system.

Performing Install Wizard for Primary Antenna System

To perform the Install Wizard of the primary antenna system, follow the steps below.

1. **Assigning Active Antenna**

Select **"Primary"** for the Antenna Active option. Click the **Apply** button to apply the settings to the system.



2. **Performing Install Wizard**

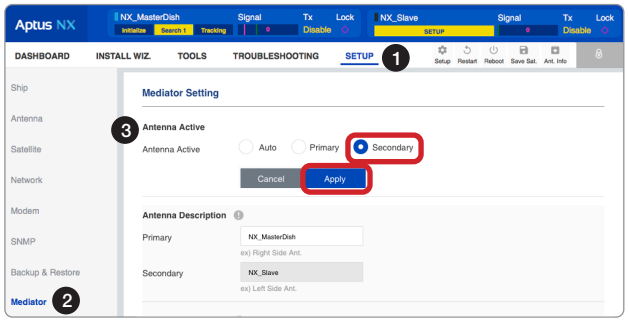
Perform the Install Wizard process. Refer to **"7.4 Starting Install Wizard" on page 54** for more details.

Performing Install Wizard for Secondary Antenna System

To perform the Install Wizard of the secondary antenna system, follow the steps below.

1. **Assigning Active Antenna**

Select **"Secondary"** for the Antenna Active option. Click the **Apply** button to apply the settings to the system.



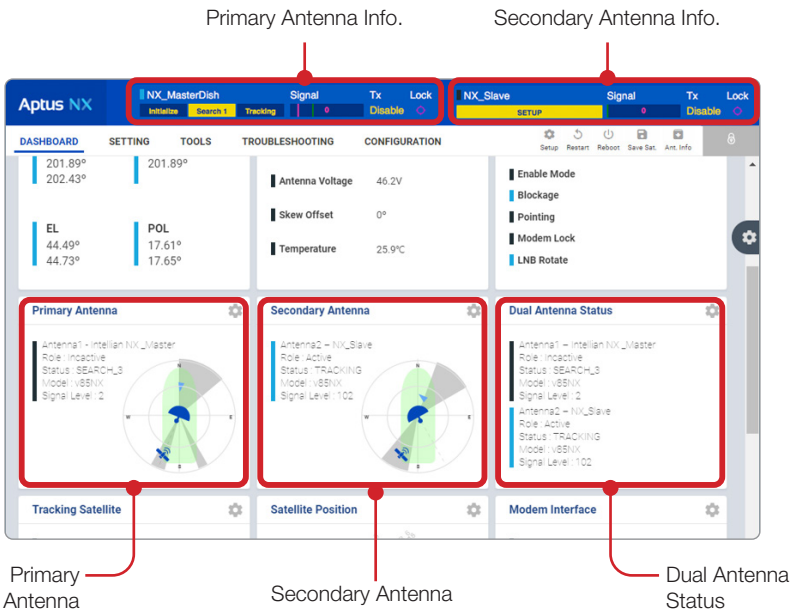
2. **Performing Install Wizard**

Perform the Install Wizard process. Refer to **"7.4 Starting Install Wizard" on page 54** for more details.

Then, perform **"9.8.3 iARM Save & Reboot" on page 92**.

12.2.4 Monitoring Dual Antenna System

You can monitor the performance of the Dual Antenna System via AptusNX. The information of the primary and secondary antennas is shown on the Top Menu bar. On the Dashboard, the Dual Antenna Status, Primary Antenna, and Secondary Antenna panels are displayed for the monitoring.



12.3 Appendix C. Important notice of waterproofing connector

12.3.1 Introduction

During antenna installation, it is important to ensure that once the cable is connected to the antenna, proper waterproofing of the connector must b e done with a self-amalgamating tape.

If you need any assistance, please contact Intellian Technical Support (support@intelliantech.com).

12.3.2 Outline of taping

Self-amalgamating tape comes with a protective, plastic peel-away layer that allows the tape to rolled and shipped. To waterproof a connector, you need to begin by peeling away a portion of this protective plastic layer and then start wrapping the tape around it.

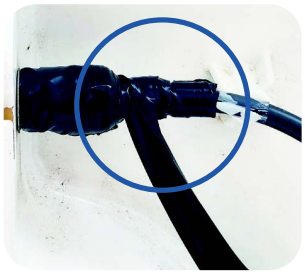
12.3.3 Procedure

1. Connect the cable to the connector to be fully secured.

CAUTION

- DO NOT over-tighten the connector, nuts, or screws when mounting the antenna to prevent any damage.
- DO NOT leave any cables loosen and non-fixed, especially for those installed outside of the antenna.

2. Apply tape over the connetor.
   It is important to wrap the cable onto itself and the best practice is to wrap the tape over itself by 50%, meaning that once you wrap your first layer your second layer should overlap over half of the first layer, and so on. This ensures that you get a strong bond between the different layers of tape that properly adhere to one another.



3. Ensure that the entire RF connector is taped up as shown the picture right.

WARNING

- Note that you cannot use ordinary electrical tape to waterproof the RF connector. Only self-amalgamating tape is able to waterproof the connector properly.
- Failure to do so will result in rust and corrosion to the cable and its connector and this might end up damaging the antenna.